



FRIDAY, NOVEMBER 23.

Dumont's Time Indicator, or Illuminated Time Case.

The engraving represents a device for exhibiting time signals on railroads on which the movement of following trains is controlled by an interval of time after preceding trains have passed stations, which has been patented by Mr. Jas. H. Dumont, of No. 43 East 117th street, New York. The engraving represents a perspective view of the indicator, which consists of a box or housing containing a suitable light. Instead of slides showing the day of week and kind of train, which are ordinarily used, the inventor has substituted wooden frames or sashes hung upon hinges, into which are fitted light cast-iron plates with letters cut through them. Behind these are two plates of double-thick glass, with a transparent white substance between them, which is considered superior to ground glass because both sides are smooth and therefore easily kept clean. The iron plates, which give the desired information, are black, and thus there is a very decided contrast by daylight between them and the color shown through the glass behind. When illuminated at night the glass appears the color of molten iron.

The vertical slides at the lower part are also of iron and of like construction, and are lifted from their position in exchanging them. Behind these figures is a sash or wooden slide containing the transparent substance, which can be withdrawn, with or without disturbing the figures. Each of these figures has a cast guard plate and support to hold it in position.

The signals are illuminated by an ordinary kerosene lamp, which is inserted through a door shown in the engraving. The heat generated from the lamp effectually prevents the accumulation of snow and sleet. The gaseous products of combustion escape through an opening in the top, so formed as to exclude wind and rain, while allowing the products of combustion to escape freely. Directly beneath, and forming a part of the case, is a series of pigeon holes for holding figures, etc., when not in actual use, which is provided with a door, lock and key.

This device has been tested on the Harlem River Branch of the New York, New Haven & Hartford Railroad, and is said to be superior to all other similar signals and to be efficient, economical and durable.

Train Accidents in October.

The following accidents are included in our record for the month of October.

COLLISIONS.**REAR.**

On the morning of the 1st a coal train on the Ohio Southern road ran into some cars which had broken loose from a preceding coal train near Bainbridge, O. The caboose was wrecked and a passenger in it was hurt.

On the night of the 1st a freight train on the Chicago, Burlington & Quincy road broke in two near Maquon, Ill., and the rear section ran into the forward one, wrecking the tender and several cars and injuring a brakeman.

On the night of the 3d a freight train on the St. Paul & Duluth road ran into a preceding freight train near Duluth, Minn., damaging several cars.

Very early on the morning of the 4th a coal train on the New York, Lake Erie & Western road ran into the rear of a passenger train which had run off the track near Bradford, Pa., wrecking a car which remained on the track.

On the morning of the 5th a freight train on the Pittsburgh, Cincinnati & St. Louis road ran into the rear of another freight train in Columbus, O., wrecking several cars and killing a brakeman.

On the night of the 5th a coal train on the Delaware, Lackawanna & Western road ran into a preceding freight train near Cresco, Pa., and the engine and 40 cars were piled up in a bad wreck. The engineer was killed and the fireman fatally hurt.

On the morning of the 5th a passenger train on the Cincinnati, Indianapolis, St. Louis & Chicago road ran into a freight train in Cincinnati, O., wrecking three cars and injuring a brakeman.

On the evening of the 5th a freight train on the Missouri Pacific road broke in two near Little Blue, Mo., and the rear section ran into the forward one, wrecking several cars.

On the afternoon of the 8th a freight train on the Boston & Lowell road ran into a ballast train near Lowell, Mass. The engineer and fireman of the ballast train jumped without shutting off steam, and the engine started off alone, ran nearly two miles to Lowell, ran through the end of the station, wrecking the express office, and finally jumped into a cellar. A woman who was in the express office was killed.

On the evening of the 10th a freight train on the Missouri Pacific road broke in two near Pacific, Mo., and the rear section ran into the forward one, damaging several cars.

On the morning of the 10th a passenger train on the Cincinnati, Hamilton & Dayton road ran into part of a freight train left on the main track at Wapakoneta, O. The engine and two cars were wrecked and the engineer and fireman hurt.

On the morning of the 10th, as a freight train on the Sussex Railroad was making a flying switch in Newton, N. J., the switch was not turned soon enough and the train ran into the engine, wrecking the tender and two coal cars.

On the evening of the 10th a freight train on the Chicago & Northwestern road ran into some cars which had broken loose from a preceding freight near Owatonna, Minn., damaging an engine and three cars.

Very early on the morning of the 6th a freight train on the Missouri Pacific road ran into a preceding freight which had stopped for water at Lamie, Mo., damaging several cars and injuring a fireman.

On the evening of the 6th a freight train on the Chicago, Burlington & Quincy road ran into some cars which had broken loose from a preceding freight near Kewanee, Ill., doing much damage.

On the morning of the 7th a through freight train on the Lake Shore & Michigan Southern road ran into the rear of

a local freight, which had stopped at Pittsford, Mich., wrecking the way car and two freight cars, killing three passengers in the way car and injuring two others.

On the evening of the 7th a freight train on the Pennsylvania Railroad ran into some cars which had broken loose from a preceding freight near Railroad Mills, N. J., damaging several cars and injuring three men in the caboose.

On the evening of the 8th a freight train on the Rochester & Pittsburgh road ran into a preceding freight in Rochester, N. Y., doing a little damage.

On the night of the 8th a freight train on the Chicago, Milwaukee & St. Paul road broke in two near Janesville, Wis., and the rear section ran into the forward one, doing some damage.

On the morning of the 9th a freight train on the Minneapolis & St. Louis road ran into the rear of a preceding freight, which had stopped on the main track in Wasco, Minn., damaging several cars and killing a driver who was in the caboose. There was a dense fog at the time.

On the evening of the 9th a freight train on the Chicago, Milwaukee & St. Paul road broke in two near Janesville, Wis., and the rear section ran into the forward one, wrecking five cars.

On the morning of the 11th a passenger train on the Philadelphia, Wilmington & Baltimore road ran over a misplaced switch and into another passenger train standing on a siding in Wilmington, Del. Both engines were slightly damaged.

On the morning of the 11th a freight train on the Cincinnati, Hamilton & Dayton road ran into a preceding freight near Connorsville, Ind., wrecking two cars.

On the morning of the 11th a passenger train on the New York, Ontario & Western road ran into a freight train which was just going into a siding at Earlville, N. Y., doing considerable damage.

On the afternoon of the 11th a passenger train on the Delaware, Lackawanna & Western road ran into a shifting coal train in the yard at Hoboken, N. J., wrecking two coal cars.

On the evening of the 12th a passenger train on the Indiana, Bloomington & Western road ran into a caboose which had been left standing on the main track in Indian-



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apolis, Ind., wrecking it. A postal clerk was thrown down and hurt.

On the afternoon of the 13th a freight train on the New York, Lake Erie & Western road ran into a preceding freight near Hornellsville, N. Y. Several cars were wrecked and the conductor killed.

On the evening of the 13th a freight train on the New York & New England road ran into a preceding freight which had stopped at Manchester, Conn., to leave some cars. Two cars were wrecked, five others damaged and the road blocked several hours. A brakeman had been sent back with a signal, but the second train was too near the first to be stopped.

Very early on the morning of the 14th a freight train on the New York, Lake Erie & Western road ran into the rear of a preceding freight which had been stopped by a wreck near Waverly, N. Y. Several cars were wrecked and a tank car full of oil caught fire, and the wreck was destroyed.

On the morning of the 14th a freight train on the Pennsylvania Railroad ran into a preceding freight near Menlo Park, N. J., damaging six cars. The engineer was hurt.

On the evening of the 14th a passenger train on the Philadelphia & Reading road ran over a misplaced switch and into a coal train standing on a siding near Reading, Pa., wrecking several cars.

On the evening of the 14th a freight train on the Union Pacific road broke in two near Gilmore, Neb., and the rear section ran into the forward one, wrecking 14 cars.

On the night of the 14th a freight train on the Chicago, Burlington & Quincy road ran into some cars which had broken loose from a preceding freight near Grand River, Ia. The engine and 11 cars were wrecked, the fireman fatally hurt, the engineer and a brakeman less severely injured.

On the evening of the 15th a passenger train on the St. Louis, Iron Mountain & Southern road ran into the rear of a freight train near Iron Mountain, Mo., damaging several cars.

Very early on the morning of the 17th a freight train on the New York, Lake Erie & Western road broke in two near Wellsburg, N. Y., and the rear section ran into the forward one, wrecking several cars.

On the evening of the 17th a coal train on the Lehigh Valley road ran into a preceding coal train near Thompson, N. Y., damaging several cars.

On the evening of the 17th a passenger train on the Rochester & Pittsburgh road ran over a misplaced switch and into a freight train standing on a siding in Scottsville, N. Y. Both engines and three cars were damaged, the conductor and a passenger slightly hurt.

Early on the morning of the 18th a freight train on the New York Central & Hudson River road ran into a preceding freight at East Rochester, N. Y., wrecking a car.

On the afternoon of the 18th the pay-train on the Philadelphia & Reading road ran into the rear of a freight train which had stopped at Exeter, Pa., damaging seven cars.

On the evening of the 13th the engine of a freight train on the New York, Lake Erie & Western road, which was taking water at Susquehanna, Pa., suddenly started off and ran into the rear of another freight, upsetting the caboose.

On the evening of the 18th a freight train on the Pittsburgh, Cincinnati & St. Louis road ran into a preceding freight, which had stopped at Coshocton, O. The engine and seven cars were damaged.

On the evening of the 19th a freight train on the New York Central & Hudson River road ran into a preceding freight near Troy, N. Y., damaging several cars.

On the morning of the 20th a yard engine on the New York, Lake Erie & Western road ran into a freight engine standing on the track in Binghamton, N. Y., doing some damage.

On the night of the 21st a freight train on the New York, Lake Erie & Western road broke in two near Shohola, N. Y., and the rear section ran into the forward one, damaging several cars.

On the morning of the 22d a freight train on the New York Central & Hudson River road ran into a local freight, which was switching across the east-bound track at Ilion, N. Y. The engine and several cars were badly broken.

On the morning of the 23d a freight train on the Pittsburgh and Western road broke in two near Zellenople, Pa., and the rear section afterward ran into the forward one, damaging five cars.

On the morning of the 24th a passenger train on the Central Pacific road ran into some cars which had been left on the main track in Oakland, Cal. A car was wrecked and the engine damaged.

On the night of the 26th a freight train on the Cincinnati, Hamilton & Dayton road ran into a preceding freight which had stopped at Tadmire, O., for water, damaging 13 cars.

On the morning of the 25th a freight train on the Pennsylvania Railroad ran into a preceding freight near East Camden, N. J. An engine and several cars were damaged and a fireman hurt. There was a thick fog at the time.

On the morning of the 25th a freight train on the Central Pacific road ran into a preceding freight near Susan, Cal., damaging an engine and 13 cars.

On the morning of the 27th a passenger train on the Denver & Rio Grande road ran into the rear of a freight near Larspur, Col., damaging the engine and several cars.

On the morning of the 27th a passenger train on the Grand Trunk road ran into the rear of a gravel train near Foxboro, Ont., damaging several cars and injuring three passengers.

On the evening of the 27th a freight train on the Chicago, Burlington & Quincy road ran into a preceding freight near Creston, Ia., doing some damage.

On the morning of the 29th several cars of a coal train on the Cranberry Coal road broke loose and ran down the steep grade at high speed nearly to Oil City, Pa., where they struck another train standing on the track. A number of cars were wrecked, and two of them were thrown over against a small house completely demolishing it. A brakeman was hurt.

On the evening of the 29th a passenger train on the Eastern road ran into a freight car which had been left by a switching engine standing on the track in Salem, Mass. The car was wrecked and the engine damaged.

On the morning of the 30th a freight train on the Delaware, Lackawanna & Western road ran into a preceding freight in Hoboken, N. J., damaging several cars.

Near midnight on the 30th a coal train on the Central Railroad of New Jersey ran into a preceding coal train near Lebanon, N. J., and the engine and 40 cars were piled up in a bad wreck. The engineer was hurt.

Very early on the morning of the 31st the engine of a passenger train on the Louisville & Nashville road, which was backing up to its train at Bowling Green, Ky., was not stopped in time and ran into the train, wrecking one car and the tender.

BUTTING.

About noon on the 1st there was a butting collision between two passenger trains on the New York, West Shore & Buffalo road, near Fort Plain, N. Y. Both engines and three cars were completely wrecked, one engineer killed, a passenger killed and another fatally hurt. The east-bound train had orders at Fort Plain to proceed. The operator at St. Johnsville had orders to hold the west-bound train and put out a flag, but the engineer disregarded it and went on, after stopping at the station (which is some distance from the telegraph office) for passengers. The operator could not reach the station in time to give further warning.

Very early on the morning of the 2d there was a butting collision between two freight trains on the Louisville, New Albany & Chicago road at Surrey, Ind. One of the trains was going into a siding, but had several cars still on the main track. Several of these cars were wrecked and both engines damaged.

On the morning of the 2d there was a butting collision between two passenger trains on the New York Central & Hudson River road in Buffalo, N. Y. Both engines were damaged and a passenger hurt.

On the morning of the 5th there was a butting collision between a freight and a repair train on the Louisville, New Albany & Chicago road near Maple Grove, Ind. Both engines and three cars were damaged and an engineer hurt.

On the night of the 5th there was a butting collision between two freight trains on the Chicago, Rock Island & Pacific road near Casey, Ia. Both engines and several cars were damaged. There was a dense fog at the time.

On the morning of the 6th there was a butting collision between two construction trains on the Northern Pacific road near Sand Point, Washington Territory. Both engines were badly damaged.

On the morning of the 6th there was a butting collision between a freight and repair train on the Wabash, St. Louis & Pacific road near Tamworth, Ia. Both engines and several cars were damaged and two trainmen hurt.

On the morning of the 11th there was a butting collision between two freight trains on the Chicago & Northwestern road near Afton, Wis. Both engines and 15 cars were wrecked and a fireman killed.

On the night of the 13th there was a butting collision between two freight trains on the New York & New England road near Hartford, Conn., damaging both engines and several cars.

On the night of the 15th there was a butting collision between two freight trains on the East Tennessee, Virginia & Georgia road near Cleveland, Tenn., caused by a failure to deliver orders to one of the trains. Both engines and several cars were wrecked, an engineer and a fireman killed, six other trainmen, and a tramp, who was stealing a ride, injured.

On the evening of the 15th there was a butting collision between a yard engine and a switching freight train on the Wabash, St. Louis & Pacific road in Detroit, Mich. Both engines were slightly damaged, and a boy, who was stealing a ride on the yard engine pilot, was killed.

On the morning of the 16th there was a butting collision between a freight and a construction train on the Oregon

& California road in East Portland, Or. Both engines were damaged, two cars wrecked, and a trainman hurt.

On the evening of the 20th there was a butting collision between a New York & New England freight train and a Newburgh, Dutchess & Columbia freight in the yard at Glenham, N. Y. Both engines were damaged.

On the evening of the 22d there was a butting collision between a passenger train and the pay train on the Atchison, Topeka & Santa Fe road, near Winfield, Kan., caused by a mistake in orders. Both engines and three cars were damaged and a fireman badly hurt.

On the evening of the 24th there was a butting collision between a freight and a ballast train on the Buffalo, New York & Philadelphia road near Elma, N. Y., caused by a mistake as to time. Both engines and several cars were wrecked and five cars destroyed by fire.

On the evening of the 25th two cars broke loose from a freight train on the Central Pacific road, which was switching at Pino Siding, Cal. The cars ran back down grade and into the head of a passenger train which was coming up. Both the runaway cars were completely wrecked, both engines and a car of the passenger train badly damaged.

On the morning of the 26th there was a butting collision between two freight trains on the Wheeling & Lake Erie road near Fremont, O., by which both engines and 12 cars were badly damaged.

On the morning of the 26th there was a butting collision between a freight and a repair train on the Philadelphia, Wilmington & Baltimore road in Philadelphia. Both engines and several cars were wrecked, the wreck being piled up so high in a cut as to break down a street bridge crossing the track.

On the morning of the 28th there was a butting collision between two freight trains on the Cincinnati, Indianapolis, St. Louis & Chicago road near Stockwell, Ind. Both engines were wrecked, 20 cars damaged and a brakeman killed.

On the morning of the 31st there was a butting collision between two freight trains on the Toledo, Cincinnati & St. Louis road, near Fayette Junction, O. Both engines were damaged, an engineer and a fireman hurt.

CROSSING.

On the evening of the 8th a Chicago & Northwestern freight train ran into a Chicago, Milwaukee and St. Paul freight at the crossing in Owatonna, Minn. An engine and three cars were wrecked.

On the morning of the 13th a switching engine coming out of a furnace siding at Lemont Furnace, Pa., across the track of the Pennsylvania Railroad, struck a passenger train which was passing on the main track, wrecking a passenger car in the middle of the train, injuring nine passengers seriously and nine others slightly. The wrecked car caught fire and was destroyed.

On the night of the 16th a New York, Lake Erie & Western yard engine ran into a New York, Chicago & St. Louis passenger train at the crossing in Buffalo, N. Y. The engine was damaged, a baggage car wrecked, and the fireman fatally hurt.

Early on the morning of the 28th a Michigan Central freight train struck a Chicago, St. Louis & Pittsburgh passenger train at the crossing of the two roads at Joliet Crossing, Ind. The passenger engine was badly wrecked. One engineer was fatally hurt, the other engineer and a brakeman killed, and the watchman at the crossing was also killed, the wreck of the engine being thrown over on his house and crushing it.

DERAILMENTS.

BROKEN RAIL.

On the evening of the 17th a passenger train on the Texas & Pacific road struck a broken rail near Texarkana, Tex., and several cars were thrown from the track. Two passengers were hurt.

On the morning of the 23d a passenger train on the Louisville & Nashville road struck a broken rail at Rankin Switch, Ill., and the two rear cars were thrown from the track, upset and badly broken, injuring two trainmen and seven passengers, besides a number slightly bruised.

On the afternoon of the 24th the engine of a passenger train on the Texas & Pacific road was thrown from the track near Scottsville, Tex., by a broken rail and upset, injuring the engineer badly.

On the morning of the 30th a passenger train on the East Tennessee, Virginia & Georgia road struck a broken rail near Hazlehurst, Ga., and two cars were thrown from the track.

BROKEN RAIL-JOINT.

On the morning of the 31st the engine of a passenger train on the New York, Ontario & Western road was thrown from the track near Walton, N. Y., by a broken fish-plate.

BROKEN BRIDGE.

On the morning of the 23d a passenger train on the Delaware & Hudson Canal Co.'s road went through the bridge over the Champlain Canal feeder at Glens Falls, N. Y. The engine went across, but two cars went down with the bridge and were wrecked, killing three passengers, injuring six trainmen and 15 passengers.

On the night of the 26th a freight train on the Houston & Texas Central road went through a bridge near Dallas, Tex., which had been partially burned. The engine went over, but 15 cars went down into Bear Creek in a bad wreck.

SPREADING OF RAILS.

Very early on the morning of the 4th two cars of a passenger train on the New York, Lake Erie and Western road were thrown from the track near Bradford, Pa., by the spreading of the rails. One car upset down a bank, injuring three passengers. It is said that trackmen had been at work and left the rails insecurely fastened.

On the morning of the 6th three cars of a stock train on the Missouri, Kansas & Texas road were thrown from the track near Pleasant Green, Mo., by the spreading of the rails. A brakeman and a driver were hurt.

On the morning of the 8th four cars of a freight train on the Chicago, Milwaukee & St. Paul road were thrown from the track near Portage, Wis., by the spreading of the rails. The conductor was hurt.

On the morning of the 15th eight cars of a freight train on the Pennsylvania Railroad were thrown from the track at Safe Harbor, Pa., by the spreading of the rails.

On the night of the 19th nine cars of a freight train on the Central Railroad of Georgia were thrown from the track near Geneva, Ga., by the spreading of the rails.

On the morning of the 22d the engine and three cars of a freight train on the Wabash, St. Louis & Pacific road were thrown from the track near Delphi, Ind., by the spreading of the rails. The fireman was badly hurt.

On the morning of the 22d three cars of a passenger train on the Texas & St. Louis road were thrown from the track near Pine Bluff, Ark., by the spreading of the rails. A passenger was slightly hurt.

On the evening of the 24th the engine of a freight train on the Central Pacific road was thrown from the track at Clipper Gap, Cal., by the spreading of the rails on a siding.

On the evening of the 27th a passenger train on the Chicago & Alton road was thrown from the track near Glen-

dale, Mo., by the spreading of the rails. Four cars left the track and went down a bank, all of them being badly broken. Two trainmen and 13 passengers were hurt.

On the morning of the 30th a freight train on the Northeastern road was thrown from the track on the trestle over Santee Swamp, S. C., by the spreading of the rails, and 16 cars loaded with ties went off the trestle and were piled up in a bad wreck. The wreck caught fire and the whole train and 200 ft. of the trestle were burned up. The engineer was killed and three trainmen hurt.

On the morning of the 31st a passenger train on the Toledo, Cincinnati & St. Louis road was thrown from the track near Mason, O., by the spreading of the rails. The rear car upset, injuring two passengers badly and five others slightly.

On the morning of the 31st a freight train on the Savannah, Florida & Western road was thrown from the track near Waycross, Ga., by the spreading of the rails. A trainman was killed and two others hurt.

BROKEN WHEEL.

On the evening of the 18th seven cars of a freight train on the Canada Southern road were thrown from the track near Villa Nova, Ont., by a broken wheel.

On the evening of the 29th 10 cars of a freight train on the New York Central & Hudson River road were thrown from the track near Bergen, N. Y., by a broken wheel.

On the night of the 31st several cars of a freight train on the Southern Pacific road were thrown from the track near Santa Ana, Cal., by a broken wheel. The cars were dragged on the ties upon a small bridge, breaking it down, and were thrown into the river below.

BROKEN AXLE.

On the evening of the 8th three cars of a passenger train on the Canadian Pacific road were thrown from the track at Deux Rivières, Ont., by a broken axle. The cars were wrecked, a passenger killed and seven others hurt.

Early on the morning of the 10th a car of a freight train on the Pennsylvania Railroad was thrown from the track in Elizabeth, N. J., by a broken axle.

On the morning of the 10th six cars of a stock train on the Texas & Pacific road were thrown from the track at Strawn, Tex., by a broken axle.

On the afternoon of the 10th a passenger train on the Fulton County road was thrown from the track near Sepo, Ill., by the breaking of an axle under the engine. Three cars upset, and the engine was badly damaged.

On the morning of the 15th eight cars of a freight train on the New York Central & Hudson River road were thrown from the track near Byron, N. Y., by a broken axle.

Early on the morning of the 17th several cars of a freight train on the Northern Central road were thrown from the track near Emigsville, Pa., by a broken axle. A brakeman was hurt.

On the evening of the 30th a car of a freight train on the New York, Lake Erie & Western road was thrown from the track in Binghamton, N. Y., by a broken axle.

BROKEN TRUCK.

On the morning of the 17th the engine and two cars of a passenger train on the Vandalia Line were thrown from the track near Hagerstown, Ill., by the breaking of the engine truck. The engine was completely wrecked and the mail car forced up on top of it; the fireman was killed and the engineer badly hurt.

On the evening of the 19th a car of a coal train on the Tioga & Elmira State Line road was thrown from the track near Elmira, N. Y., by a broken truck and 50 cars were piled up in a bad wreck, some of them going over a bridge into a small creek.

On the morning of the 26th eight cars of a freight train on the New York, Lake Erie & Western road were thrown from the track near Howell, N. Y., by a broken truck.

LAND SLIDE.

On the morning of the 16th a passenger train on the Denver & Rio Grande road struck a land slide near Green River, Utah, and the engine was thrown from the track and wrecked, killing the engineer.

WIND.

On the night of the 18th a passenger train on the East Line & Red River road was struck by a tornado near Sulphur Springs, Tex., and all the cars were blown from the track and badly damaged, injuring nine passengers, three of them severely.

ACCIDENTAL OBSTRUCTION.

On the morning of the 4th a passenger train on the Northern Pacific road struck a large stone which had fallen on the track near Spokane Falls, Wash., and the engine was thrown from the track.

On the morning of the 5th a freight train on the Pittsburgh, Cincinnati & St. Louis road struck the wreck of a car which was thrown upon the track in front of it by a collision on the other track in Columbus, O. The engine was thrown from the track and damaged.

On the morning of the 6th a freight train on the Northern Central road struck a wagon which was crossing the track at Flint Creek, N. Y., and the engine was thrown from the track. Three trainmen were hurt and the teamster was killed.

Early on the morning of the 10th a passenger train on the Pennsylvania Railroad struck a freight car which had been thrown over on its track by a derailment on the opposite track, in Elizabeth, N. J. The car was wrecked and the engine thrown over on its side and badly damaged.

On the afternoon of the 10th as a coal train on the Boston & Lowell road was near Middleton, Mass., a draw bar pulled out and fell on the rail, throwing off 12 cars. A brakeman was hurt badly.

On the evening of the 18th a passenger train on the Denver & Rio Grande road ran into a large stone which had fallen on the track near Gunnison, Col. The engine and two cars were thrown from the track, the engineer killed, the fireman and the baggage man hurt.

On the morning of the 29th a freight train on the New York Central & Hudson River road was thrown from the track near Bergen, N. Y., by a brake-beam which dropped down on the rails, and 15 cars were scattered over three tracks.

CATTLE.

On the morning of the 8th a freight train on the Savannah, Florida & Western road ran over a cow near Waycross, Ga., and the engine and several cars were thrown from the track. The engineer was fatally scalded.

On the afternoon of the 9th a passenger train on the Delaware, Lackawanna & Western road ran over a cow near Boonton, N. J., and the engine was thrown from the track.

On the morning of the 11th a passenger train on the Louisville, New Albany & Chicago road ran over a cow near Monticello, Ind. The engine and two cars were thrown from the track and the engineer hurt.

On the evening of the 21st a freight train on the Oregon Railway & Navigation Co. road ran over a cow near Riparia, Wash. Ter., and two cars were thrown from the track and wrecked.

Very early on the morning of the 26th a passenger train on the Denver & Rio Grande road ran over a horse near Thistle Creek, Utah, and the engine and two cars were thrown from the track. The engineer was hurt.

On the morning of the 30th a passenger train on the Kentucky Central road ran over a bull near Falmouth, Ky., and three cars were thrown from the track.

MISPLACED SWITCH.

On the evening of the 4th the engine and four cars of a freight train on the Chicago, Milwaukee & St. Paul road were thrown from the track in Milwaukee, Wis., by a misplaced switch.

On the night of the 5th the engine of a passenger train on the Chicago & Alton road was thrown from the track in Alton, Ill., by a misplaced switch, and upset.

On the evening of the 6th two cars of a coal train on the New York, Lake Erie & Western road were thrown from the track in Middletown, N. Y., by a misplaced switch.

On the morning of the 11th, as a local passenger train on the Texas & Pacific road was starting out from Marshall, Tex., a new brakeman, in his haste to get aboard, turned the switch before the last trucks had passed, throwing the rear coach, with its load of passengers, down a 15-ft. trestle. The slow motion of the train prevented a fatal accident. As it was, 10 persons were more or less injured. The darkey who did the mischief clasped his hand and exclaimed, "Dar, now!" and cut for the woods.

On the morning of the 18th a freight train on the Southern Pacific road was thrown from the track at Benson, Ari., by a misplaced switch, and two brakemen were badly hurt.

On the night of the 27th a passenger train on the Northern Pacific road was thrown from the track at Hawley, Minn., by a misplaced switch, and the engine and one car upset.

On the morning of the 28th a yard engine on the Chicago Milwaukee & St. Paul road was thrown from the track in Chicago by a misplaced switch. The engine was damaged and the engineer hurt.

MISCELLANEOUS.

On the morning of the 9th a freight train on the Louisville, New Albany & Chicago road ran into the open draw of the bridge over Calumet River at Hammond, Ind., and the engine and nine cars were wrecked. It is said that there was no signal out for the draw.

On the morning of the 12th, as a local freight train was being run into the yard at Paterson, N. J., on the New York, Lake Erie & Western road, by a flying switch, the brakes failed to hold, and the train ran off the end of the siding and into a wing of the passenger station, knocking down part of the building and wrecking three cars.

On the morning of the 27th, a freight train on the Intercolonial road was thrown from the track on the bridge over Mill Stream, near Assametsquagan, N. B., where some trackmen were putting down new rails. The engine passed over, but four cars went off the bridge and fell into the stream below, carrying the bridge with them. The trackmen had signals out, but they were not seen.

MALICIOUS.

On the evening of the 16th, a freight train on the Chicago, Burlington & Quincy road was thrown from the track at Sheridan, Ill., by a switch which is said to have been purposely misplaced.

On the afternoon of the 21st a construction train on the Northern Pacific road was thrown from the track near Rocky Point, Oregon, by a plank which had been wedged in between the rails at a road crossing. Several cars were wrecked and the conductor killed. It is supposed that the plank was placed there by tramps.

On the night of the 30th several cars of a freight train on the East Tennessee, Virginia & Georgia road were thrown from the track in Knoxville, Tenn., by a switch which had been purposely misplaced. Three trainmen were slightly hurt.

On the night of the 31st a passenger train on the Hume-ston & Shenandoah road was thrown from the track near Shenandoah, Ia., where a rail had been purposely misplaced on the approach to a trestle bridge. The engine and two cars went down a high bank, killing the engineer, injuring the fireman and express messenger.

UNEXPLAINED.

Very early on the morning of the 2d a freight train on the Chicago, St. Paul, Minneapolis & Omaha road, ran off the track near Woodville, Wis., blocking the road five hours.

On the night of the 2d a special passenger train on the Intercolonial Railway was derailed at Colbrook, N. B., several cars leaving the track.

On the morning of the 4th several cars of a coal train on the Tennessee Coal road ran off the track near Cowan, Tenn., and were damaged.

On the morning of the 5th several cars of a freight train on the Pennsylvania Railroad ran off the track near Barnes-ton, Pa., and five of them were wrecked, killing a brakeman.

On the evening of the 5th a freight train on the Northern Pacific road ran off the track near Wheatland, Dak., the engine and several cars being piled up in a bad wreck. A tramp, who was stealing a ride, was killed.

On the afternoon of the 7th a car of a dummy train on the Chicago & Western road jumped the track at a curve near Oak Park, Ill., and upset into the ditch. Four passengers were seriously hurt, besides a number slightly scratched and bruised.

On the morning of the 8th a freight train on the Rome, Watertown & Ogdensburg road ran off the track near Gouverneur, N. Y., blocking the road several hours.

On the morning of the 11th the engine of a freight train on the New York, Lake Erie & Western road ran off the track in Middletown, N. Y., blocking one track two hours.

On the afternoon of the 12th the baggage car of a passenger train on the New York & New England road jumped the track at a frog in Hartford, Conn., and, with a palace car following, was thrown across the track, blocking the road three hours.

On the morning of the 16th two cars of a freight train ran off the track at Winspear Bridge, N. Y., on the New York Central & Hudson River road.

Very early on the morning of the 17th four cars of a freight train on the New York, Lake Erie & Western road ran off the track in Elmira, N. Y., blocking the road five hours.

On the morning of the 17th three cars of a freight train ran off the track near Gainesville, N. Y., on the New York Central & Hudson River road.

On the evening of the 17th two cars of a freight train on the Grand Rapids & Indiana road ran off the track in Grand Rapids, Mich. The cars were dragged upon a bridge, damaging it badly.

On the morning of the 18th a car of a construction train on the New Orleans & Northeastern road was thrown from the track near Purvis, Miss. Three laborers on the car were killed and four others hurt.

On the morning of the 19th a construction train on the Mississippi, Terre aux Boeufs & Lake road ran off the track near English Bend, La., wrecking two cars and injuring 10 laborers.

On the evening of the 20th several cars of a coal train on

the Columbus, Hocking Valley & Toledo road jumped the track near Carroll, O., and rolled over down a high bank, killing the conductor and injuring a brakeman badly.

On the afternoon of the 23d two cars of a coal train on the New York Central & Hudson River road ran off the track near Memphis, N. Y., doing a little damage.

Very early on the morning of the 23d the rear car of a passenger train on the Indiana, Bloomington & Western road ran off the track near Rainstown, Ind., and rolled over down a bank. The car was badly broken up, seven passengers were seriously and 11 slightly hurt.

On the morning of the 25th the engine and one car of a freight train on the Utica, Ithaca & Elmira road ran off the track in Canastota, N. Y., doing some damage.

On the afternoon of the 25th the engine of a passenger train on the Utica, Ithaca & Elmira road ran off the track in Canastota, N. Y., blocking the road four hours.

On the night of the 26th three cars of a freight train on the Louisville & Nashville road ran off the track near Williamsburg, Ky., and upset down a bank, injuring the conductor.

On the morning of the 27th a freight train on the Richmond & Allegheny road ran off the track in Richmond, Va. Two cars ran into a brick building close to the track, knocking down the whole front of it.

Very early on the morning of the 28th a freight train on the Chicago, St. Paul, Minneapolis & Omaha road ran off the track near Stillwater Junction, Minn., blocking the road three hours.

On the morning of the 31st a car of a passenger train on the Toledo, Cincinnati & St. Louis road ran off the track near Mason, O., and upset, injuring three passengers.

OTHER ACCIDENTS.

BOILER EXPLOSIONS.

On the morning of the 10th a yard engine on the Central Railroad of Georgia exploded its boiler in Augusta, Ga. The engine was completely wrecked, the engineer and fireman dangerously scalded.

On the morning of the 15th the locomotive of a freight train on the Grand Trunk road exploded its boiler at Yarmouth, Me. The force of the explosion was upward, and a large piece of the boiler was carried nearly a quarter of a mile. The engineer and fireman were thrown back into the tender, but were only slightly hurt.

On the evening of the 16th the engine of a freight train on the Central Iowa road exploded its boiler when near Lacey, Ia. The train was going down a steep grade and through a cut, and the engine was not using steam. The engine was turned around across the track by the explosion, a large part of the crown-sheet being torn off and thrown several hundred feet away. The first car was torn to pieces, and the momentum of the train carried it on so that all the 19 cars were piled up over the engine in a wreck filling the whole cut. The engineer was killed, the fireman, conductor and a brakeman badly hurt.

MISCELLANEOUS.

On the afternoon of the 2d, as a passenger train on the Housatonic road was passing through Bridgeport, Conn., one of the locomotive truck axles broke close to the hub of the wheel, and the wheel was thrown off at one side the track. The engine did not leave the track.

On the afternoon of the 14th a car of a freight train on the Louisville & Nashville road caught fire when near Montgomery, Ala., and five cars loaded with cotton were destroyed.

On the evening of the 16th a car loaded with cotton in a freight train on the Vicksburg & Meridian road caught fire near Jackson, and was entirely destroyed.

On the morning of the 24th a car in a passenger train on the New York Central & Hudson River road caught fire when near Lyons, N. Y. While trying to put out the fire a passenger fell and broke his leg.

SUMMARY.

This is a total of 174 accidents, in which 43 persons were killed and 234 injured; an increase of 38 accidents, a decrease of 4 killed and an increase of 102 injured, as compared with October of last year.

The month shows more accidents than any month of the current year except February. The number of killed was exceeded in three months, January, February and July, but the number of injured is larger than that of any previous month.

The ten months of the present year to the end of October show a total of 1,406 accidents, 407 killed and 1,565 injured, being a monthly average of 141 accidents, 41 killed and 157 injured. October was above the average in all respects.

The Market Steel Cable Railway in San Francisco.

For the following description and illustrations of this road we are indebted to the *Mining and Scientific Press* of San Francisco:

One of the regular sights of San Francisco, to the tourist or visitor, is its cable railroad system, now illustrated by numerous lines in daily operation. The latest of these, and by far the most extensive one, is the Market street line, which, with its several branches, goes through the heart of the city, and from the water-front to the suburbs. The projectors of this road are men of wealth and experience in railroad building, and determined to build the road in a manner that would make it as substantial as possible, and have spared no expense to that end. The road cost into the millions. Its equipment is first-class in every respect; and it has been not only satisfactory to its owners, but to the public. Traveling mainly on a street where there are some eight other lines of street cars, it immediately became the favorite, owing to the convenience and comfort of its cars, the speed at which they travel, and the frequency with which they pass.

On account of the novel features of this new road, and the general interest taken in the subject of these cable roads, we have had a number of engravings specially made to accompany this description. These will give not only a good general idea of the appearance of the cars, road-bed, etc., but many details of construction also. To engineers this number of the *Press* contains data of much interest, and the general reader will also find it valuable for reference. The cable railroad system is now spreading so rapidly that all the large cities in the United States will soon have cable lines. As we built the first of these roads here, our experience is useful to all others; and, no doubt, most of the roads built in the future will look to those in this city as examples for guidance.

The building of this road has had the effect of enlivening, so to speak, a large tract of this city. For some years, south of Market street and out by Valencia, the city has been rather slow, the northern and northwestern portions improving much more rapidly, and having improvements of better character. The length of time it took to get out toward the Mission or thereabouts, or even on Market street to Tenth and Twelfth streets, was detrimental to those portions

of the city. The cable cars now go from the ferry to the end of Valencia street in 34 minutes, and run frequently. All those portions of the city which the road or its branches tap have already felt the good influence of rapid communication, and the improvements will be even more plainly manifest within the next year.

THE ROAD AND ITS BRANCHES.

The main line of the road runs on the principal thoroughfare of San Francisco—Market street. The streets north and south of this all open into it, and the traffic is larger than on any other avenue in the city. Not only do the north and south streets, such as Kearny, Dupont and Stockton, and Second, Third and Fourth open into Market, but the streets north of it running across Kearny and Dupont, such as O'Farrell, Sutter, Post, Geary, etc., also open into it. This latter line of streets runs as an angle from Market. The lower ends of the cables of the Sutter and Geary street cable roads are at the junction of these respective streets and Market. The peculiar central position of Market street, therefore, makes the road a highly important one. It was

streets. This branch makes another complete line from Golden Gate Park to the ferry.

At Hayes street there is a horse-car branch out to Hayes Valley, through a populous neighborhood. The next branch to the right is that of Haight street. Every other car on the main line switches off here to go out Haight street to Golden Gate Park. At the end of the Haight street line a road is being built to run as far as the Pacific Ocean Beach and Cliff House. This will be run by steam dummies, and will be a separate line from Haight street, though connecting with it. This ocean line will soon be done, and it will be possible to go to the ocean beach for 10 cents. The Haight street branch is a very important one, and the city is building rapidly out in that direction. Opposite the main line engine-house is the Market street extension branch, a short piece of road now being operated by steam dummies, but soon to be run by a cable, provision having been made in the engine houses for the cable for this branch. It is one mile long. Baldwin locomotive dummies are now running the cars on this branch.

The grade on Market street is $3\frac{1}{2}$ ft. in 100. The grade

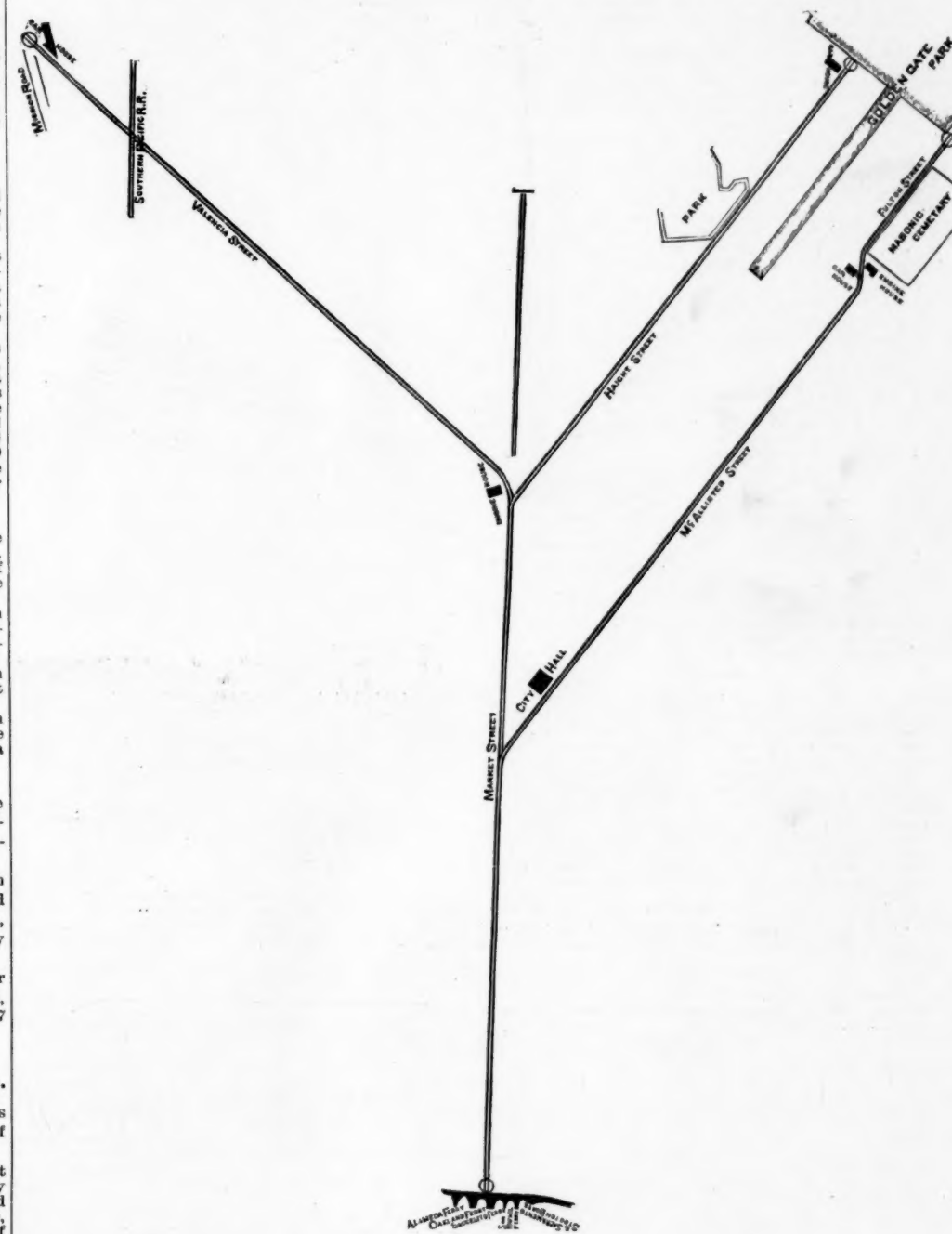


Fig. 1.

PLAN OF MARKET STREET CABLE RAILROAD AND BRANCHES.

supposed by many that a cable railroad on that thoroughfare would be almost impracticable, owing to its crowded state at certain periods of the day. Many thought the cars would have to be moved so slowly that they would be unpopular. Experience has, however, proven these fears to have been unfounded. In fact, the line makes better time than any of the cable roads, the cable running about eight miles an hour, and including an average of 30 stops, the cars run from one end to the other at a rate of about $7\frac{1}{2}$ miles an hour.

It has been found, too, that the speed at which the cars are run tends to make people more cautious than on slower roads. Moreover, the track is kept clear easily. Teamsters know that the cars run fast, and at the first sound of the gong clear the track, not taking their time about it, as is apt to be the case with slower roads. People are not apt to try to run across in front of these cars, but seem rather to prefer letting them pass. The quick speed, therefore, has been advantageous to the road, and is very satisfactory to the public.

There are several branches to this road, transfers for which are given passengers without extra charge, the fare being 5 cents. At Fifth street is a horse-car branch, one mile long, running south. At McAllister street is a cable railroad branch, which will be in running order in about a month. There will be a separate cable to Market street, run by a separate engine, and the cars will switch off from this to the Market street cable at the junction of the two

on Haight street is about $12\frac{1}{2}$ ft. in 100 at the steepest part.

THE ENGINE HOUSE.

The engine house where the motive power of the cables is applied is on the south side of Market street at the junction of Valencia. At this point Valencia leaves Market by a curve to the southeast, and Haight street branches off at an angle of about 35 degrees from Market to the northwest, some 500 ft. before Valencia is reached. The plan, fig. 1, accompanying this shows the relative position of these streets. The upper part of the main building or engine house is of wood. The basement forms the engine and fire rooms, and is the principal part of the structure. The walls and floors are of brick. In the rear are bunkers which hold 2,000 tons of coal, which may be dumped into them through chutes in the yard above. Heavy brick pillars and arches support the roof of this portion, which forms the floor of the yard above. Outside the coal bunkers is an artesian well which supplies the boilers with water. One of Dow's direct-acting deep-well pumps raises the water from this well, supplying first the heaters for the boilers, the surplus going to a tank above.

The main portion of the basement is covered with a heavy brick flooring and foundation to the boilers, engines, heaters, etc. The room is well lighted and ventilated. In the rear of the engines are the long pits and tracks for the stretching apparatus. Fig. 2 shows a plan of the engine-

house, and arrangements on the streets for the angle sheaves of the various cables; *G* are the spur wheels of the engines, which engage with each other, though the engraving shows a clear space between. The drivers are represented by *H*. The cable from the ferry is represented at *A*; and the same rope, returning to the ferry after going around the drivers and tighteners in the engine-room, is represented at *B*. Fig. 3 is a sectional view and shows the tighteners. The Haight street incoming and outgoing rope is represented at *F* and *F'*. The outgoing Valencia street cable is marked by *C*, and the incoming one by *D*. The auxiliary rope is represented by *E*, and its side-bearing sheaves are also shown.

Outside, the most prominent feature of this building is the

wood, 2 in. thick and set on end. Maple is used here, but beech is supposed to be better. The rope passes in from the street on a slight downward incline, as shown in fig. 31, just clearing the top of the forward driver, and passing on to the top of the rear one (or that next the engine, *K*). It passes three-quarters of the way around, and thence upward, diagonally forward, over the top of the forward one, then down and backward, just clearing the bottom of the rear one, to the tension-pulley *M* on the stretching carriage. There are only three-fourths of a turn on each of these drivers, or one turn and a half in all.

Yet this drives 24,000 ft. of rope with heavy loads: One would hardly suppose that mere friction of the rope would

best known. Of course each rope has to have a separate stretching and tension arrangement. The principal object in keeping the uniform tension is to prevent the rope slipping on the drivers, it being driven merely by friction. Behind the engines in the engine-room, and in line with the driving-pulleys, brick-lined excavations 165 ft. long each and 5 ft. wide and deep, have been made, one for each cable. Over each one is a stretcher arranged for a separate cable. A description of one will serve for all. A large and heavily-framed carriage, *L* fig. 3, mounted on wheels and moving on tracks, is placed over the excavation. A pair of tracks, close together, is on each side, and each pair forms a rack-bar, with which a pawl on the carriage engages. These pawls prevent the carriage moving forward, as the strain of the cable tends to make it. On top of this main carriage is a smaller one, also on rails, the rails being on the main carriage.

The small or supplemental carriage carries a vertically revolving pulley *M* about 13 ft. in diameter. The cable or rope, after it passes around the main drivers of the engine, extends back around this pulley on the carriage. A very heavy weight *N*, hanging on a chain and connected with the supplemental carriage, passes over a chain wheel on the lower carriage, and draws backward on the upper one, thus keeping a constant tension on the cable equal to one-half the amount of the weight, the strain being divided between the upper and lower ropes. This tension pulley prevents any slipping of the cable on the drivers, as elsewhere described.

The function of the lower carriage is to take up the permanent stretch of the rope. When it is found that the weight is settling down into the pit, it is known that the cable has permanently stretched. Then the lower carriage is moved back, and the pawls are dropped into the ladder formed by two T-rails with pins through the webs, forming a sort of rack-bar, thus holding the lower carriage in its position. This moving of the lower carriage is accomplished readily, notwithstanding the strain of the cable, and without necessitating the slowing of the ropes or interfering in any manner with the operation of the road. A heavy tackle is hooked to the rear end of the carriage, and the tail rope or hauling part is taken to a spindle on the end of the axle of the main sheave on the supplemental carriage. This is revolving steadily all the time, and by taking a few turns of the rope the tackle is operated by the power of the cable itself, and the carriage hauled back on its rails, the pawls before described automatically engaging with the teeth or pins provided for them, thus holding the carriage at the desired point. As the lower carriage moves back the weight rises and the upper carriage remains stationary, but changes its position with relation to the lower one. That is, when the lower carriage is drawn back as far as desired, the supplemental one is at the front end of the lower one, ready again to be moved back automatically by its compensating weight. By the arrangement described 330 ft. of each cable can be taken up.

THE WIRE CABLES.

The wire cables in use by this company were made by John A. Roebling's Sons Co., of Trenton, N. J. The rope is $4\frac{1}{2}$ in. in diameter and weighs $2\frac{1}{2}$ lbs. to the running foot. It is made of crucible steel wire. There are six strands of 19 wires each around a manilla rope heart. The main or Market street cable is 24,125 ft. long; the Valencia street is 20,194; and the Haight street 20,002 ft. long. The McAlister street cable, from the engine house at Masonic avenue to Market street, is 20,489 ft., and from the engine house to the western terminus at Fulton and Stanyan streets, 6,000 ft. The last two are the same kind of cable as the main line, but made by the California Wire Works of this city. The cable is lubricated entirely with castor oil. Tar is first used to fill up with and castor oil is added as the rope fills, until it alone is used. They have to avoid the use of tallow and other animal fats.

CARS.

One of the questions in connection with the new road which was most carefully considered was that of the construction of the cars. It was known that the traffic would be heavy at certain hours, both morning and evening, and that the ordinary form of car and dummy was not entirely satisfactory. Moreover, in changing a street road operated by horses and having the usual large stock of common four-wheeled cars, to a cable road, several things had to be taken into consideration. The outlay for reconstruction must be large in comparison with the original cost of the road, and

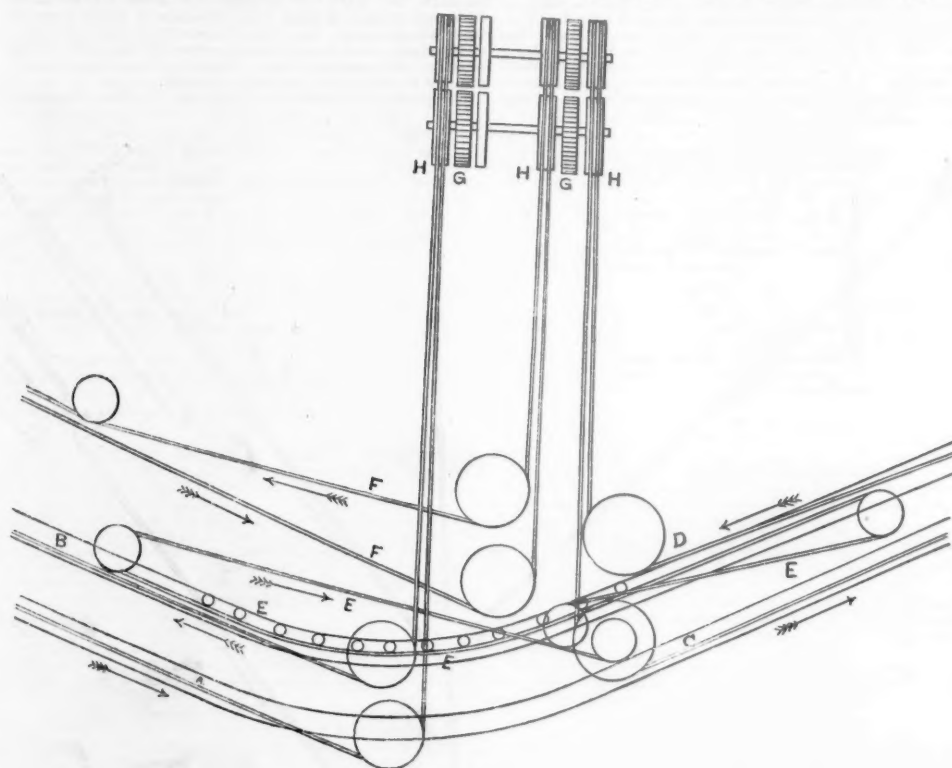


Fig. 2.

PLAN OF DRIVING DRUMS, ANGLE SHEAVES AND CABLES.

chimney, which forms an important landmark, and is next to the largest on the coast. The base is 9 ft. below the level of the fire-room floor, so that it is about 24 ft. below the surface of the ground. The foundation is 30 ft. square, battering in one inch to the course until it comes to $16\frac{1}{2}$ ft. square, where the flue enters. Then it goes up to the water table, about 10 ft. above the surface of the ground. For the rest of its height the chimney is in the form of an eight-cornered star. The inside is a circle 7 ft. 6 in. in diameter. The top of the stack is 175 ft. above its foundation, or 166 ft. above the fire-room floor. It was necessary to have this very high stack not only for good draft, but also to deliver the products of combustion high up out of the way.

THE ENGINES.

The power for the road is two pair of engines, with cylinders 34 by 48 and 24 by 48, a large and small one being

admit of this, but that it would slip. The tension apparatus is the secret of this result; without that it would be impossible. The automatic action of the weighted tension pulley, however, is such as to keep the rope closely jammed on the driving pulleys, so that it is not easy for any slip to occur. The great advantage of this method is the small number of wraps on the drivers, as wraps on drivers form one of the principal sources of breakage and wear on cables. The improvements on the old English system (where numerous wraps are used) patented by S. B. Whiting in 1876-77, and used on the Brooklyn Bridge, are unsatisfactory, for this reason: The friction wheel from which the power is derived, located in line between the shafts carrying the driving drums, relieves the bearings, but the old and principal fault of the wrapping of the rope still remains. As the part of the pulleys where the rope first comes on wears the most, the driver is not kept of uniform size.

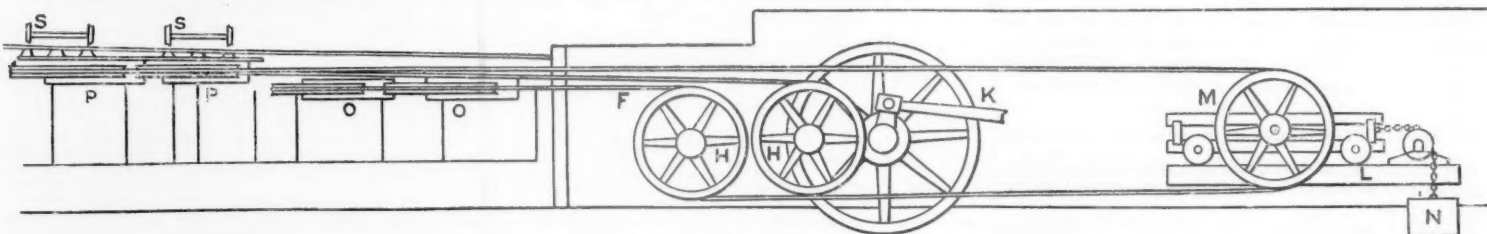


Fig. 3.

SECTION OF ANGLE-SHEAVES, DRIVERS AND TENSION APPARATUS.

compounded to work in pairs. The expansion cylinder has a capacity of double the initial cylinder. They are compounded by direct connection between the bottoms of the large and small cylinders. There is no extra receiver, the pipe answering as the receiver. Only one pair run at a time, the other pair being spare engines, to use in case of breakage of the others. These engines have Scott pillow-blocks, and the O'Neill cut-off, with automatic governor. They were made by the Union Iron Works of this city. The engines are well made, and are doing very satisfactory work, the cards showing great efficiency.

Each pair of engines furnishes 400 horse-power in ordinary working, and is capable of working up to 700 horse-power. The pinion on the engine-shaft is 4 ft. 1 in. in diameter, and 20-in. face. It connects with a spur-wheel 12 ft. 6 in. in diameter and 20-in. face, which in turn meshes with another spur-wheel of same size. Each spur-wheel shaft has two reels for the rope. The engines are set in pairs 19 ft. apart.

The boilers in use are the first of the Babcock & Wilcox type ever put up on this coast. They came here all built and ready to put up, and are guaranteed to be of 250 horse-power for each section, there being four sections. These boilers are very substantial looking structures. There is a Llewellyn water-heater, 5 ft. in diameter, and a fine pair of the Dow steam pumps, made in this city.

THE DRIVING ARRANGEMENT.

The driving method is what is known as the American method of driving, and is about the same as that used on the Gordon Plane in Pennsylvania. The engravings (figs. 2 and 3) show the general arrangement. Two pulleys, *H* and *H'*, 12 ft. in diameter, are placed in line. The rims are loose, and in between these rims are bolted blocks of

Therefore, the rope has to "overhaul" to compensate for difference in circumference between the sides of the driver where the rope comes on and goes off. This overhauling throws excessive strain on the rope, and soon breaks or tears it to pieces. By the system we have described as in use here this objection is overcome, the rope nowhere taking a complete turn of any driver. In the engraving, fig. 3, *F* and *F'* shows the Market street cable; *O* and *O'* the Haight street angle sheaves; *P* and *P'* the Market street angle sheaves; and *S* the cars on the tracks.

On the same shaft carrying the drivers are large gears *G* and *G'*, fig. 2, of about the same diameter as the drivers, operated by a spur on the engine shaft of one-third their diameter, so the engine makes three revolutions to one revolution of the drivers. V-teeth are used on these gears, and they are $4\frac{1}{2}$ pitch and 18 in. face. There are four sets of these drivers for the four ropes, but one set of gears and one pair of engines operates them all. The other pair of engines is held in reserve as a spare set in case of accident.

THE STRETCHING AND TIGHTENING ARRANGEMENT.

The tension of the wire rope on all these roads is something which has to be provided for, otherwise there would not be a uniform tension maintained. Moreover, the change in length, with the ordinary changes in temperature, during the day and night, of 24,000 ft. of metal cable, must also be looked after. On a hot day the cable is several feet longer than on a cool one, and this ever-varying change in length must be compensated for, and the apparatus for doing this must be automatic. The rope is furthermore continually lengthening by wear, and during the life of a rope the total stretch is about 1 per cent. of its total length. The method in use on this road is considered to be the

as the total cost of the cars is but a small percentage of the whole, the car must be so constructed as to fulfill the following requirements: 1. To be as safe as possible for the public; 2. To ride easily, either empty or loaded, and carry large loads if required; 3. To be easy to get on or off, and neat and symmetrical in appearance; 4. To be cheap in first cost and maintenance, and so arranged that old horse cars can be converted to cable cars without great sacrifice to property. All of these requirements seem to be fulfilled in the combination car in use on the Market street road.

The cars and dummies on this line, shown in fig. 4, are made in one. They are different from any previously made, being entirely original in design. They have more the character of a steam than a street car, as the engravings show. The whole car is 34 ft. long, and weighs 9,600 pounds. The forward part, for a distance of 14 ft., is open all around, but has a roof supported by ornamental posts. In the centre is the brake and grip mechanism, and the engineer or dummy man stands isolated in such a position that he can see ahead and on both sides. There are two front seats on each side, but the centre is open in front, so that no passenger can obstruct the view. The seats on the side are wide and comfortable, and set back so the passengers' feet are inside the line of the sides of the car; they are completely protected from passing vehicles by four strong posts. They are high up also. Outside is a broad step running lengthwise the car on each side, and on this many can stand and hold on by the strong iron vertical hand-bars shown in the engraving.

The object of arranging the seats so that the passengers may sit with their feet inside the line of the side frames of the car, is to avoid liability to accident. In case of a wagon being backed against the car, or striking it in any way, the

passengers are up out of harm's way. The height of the seat takes them up out of the dust also. The whole arrangement of these cars has proved highly satisfactory to the public and to the company. They carry large loads of passengers, run smoothly, and round the curves readily. They are, moreover, handsome in appearance. They are constructed in such a manner as to combine great strength with lightness. A noticeable feature is the absence of any jarring or jarring motion ordinarily incident to dummies. Market street being the main thoroughfare in the city, it was absolutely necessary to make the cars safe. It is easy to get on or off, by reason of the many posts and handles for support.

There is no communication for passengers between the car and dummy, and people cannot come out of the front of the car to alight. Most of the old street cars of the Market street line have been utilized by an open portion being built on, though, unless it was pointed out, the connection would not be seen. The front platforms are removed, but otherwise the cars are not changed. These cars are light and well ventilated, and their interiors are all of bright varnished woods, with wooden perforated seats. The car body has each end supported on four wheels, united by a frame or truck having a pivot or swivel, so that the trucks may turn and accommodate themselves to the curvatures of the road, as on ordinary passenger coaches. The grip is mounted on the solid truck of the forward or open portion of the car, an opening being made in the floor for it to project up through. As the distance between the pairs of wheels on the truck is small the movements of the truck in accommodating itself to the curvature of the track are small, and do not affect the grip. The long car-body can make long and sweeping curves, necessitated by its length, very readily, as the two trucks so widely separated are each on pivots, like the trucks of steam cars. The rigidity of the ordinary street car running gear is avoided, and there is no grind on the rails. It is the first time this system has been applied to street cars. The length of these

railroads, and that they are connected by a single king-bolt or pin with the body of the car. We stated elsewhere that by the use of these trucks the cars turn the curves easily, and ride without jolt.

THE BRAKES.

The brakes used on these cable railroads are very important factors in the safety of the system. On this road, particularly, running at the speed it does and through a very crowded thoroughfare, it is necessary to have the brake gear very efficient, in order that sudden stops can be made. It is found in practice that one of these cars, weighing 10,000 pounds, and loaded at that, while running at a speed of eight miles an hour, can be stopped in 10 ft. Even air-brakes could not beat this. While the ordinary brakes are attached to the wheels in the usual way, one set for the engineer and one for the conductor, each set acting independently, the main dependence is placed on the track brake.

These track brakes are the outgrowth of the cable railroad system, being adapted for use on very steep grades, where, if the wheels were locked, even, the car itself would slide on the rails. It is a very powerful appliance, and by its means one of the heavily loaded cars may be stopped very suddenly. In the first place, it may be stated that both the wheel brakes and track brakes are entirely independent of the car body, the whole mechanism being on the trucks, or running gear. The track brake is on the rear-truck, as the engraving, fig. 6, shows, between the wheels, its operating lever, however, being under control of the engineer or dummy man who handles the grip.

Under the car is placed a rock-shaft, operated by the lever, which works toggles or knee joints, forming a powerful pair of levers, which press down on each track a broad block of wood *B*. The weight of the car can almost be lifted on these blocks, so powerful is the leverage. The device is very effectual, works quickly, and is not liable to breakage. It is operated by a hand-lever. The ordinary wheel brakes are controlled by a foot lever near the engineer, so when the

rectly down alongside the cable, without offset. The grip-bar on which these parts are mounted is secured and supported by a frame on the running gear or truck, and not on the car itself. The car body can therefore be mounted on springs without any of the spring motion being imparted to the grip, and through it to the cable. In the way in which this grip is arranged all the parts liable to get out of order are accessible, and it is not necessary to provide pits in which to examine them.

When the car is at a stand-still the wire cable passes along over the chilled-iron grooved rollers at each end of the lower die. The lever operating the grip is then inclined forward. When the engineer desires to start the car he moves the hand lever back. This action moves the inner frame downward, carrying with it the upper jaw or die. This die consists of a hollow piece of soft cast iron secured in the lower end of the sliding part. The lower die is a shorter piece of soft cast-iron fitted lengthwise between the two rollers. This is arranged with set screws to be raised to take up wear. The upper die is longer than the lower, and as it is forced down by the inner frame it rests on the moving cable, and pushes or presses it tight on the rollers before pressing it on the lower die. Gradual motion is thus imparted to the car, without jerk or jar. A still further downward motion of the upper die forces the rope or cable on to the lower die, the cable being thus held tightly between the dies. A reverse motion of the lever raises the frame and upper die, and releases the cable and allows it to run through freely without imparting any motion to the car. The brake can then stop the car. The head of the toggle operating the inner frame slides up and makes a difference in the length of the link, so that wear of the upper die is accounted for. Wood has been tried for the dies, and so has brass, but soft iron is found to be as good. The dies are easily changed. The frames of the grip are made of steel, from the Judson Iron & Steel Works in Oakland. Phosphor-bronze was found to be too soft. Steel seems the best. They have been made of common cast-iron, but this is too brittle, as a blow may

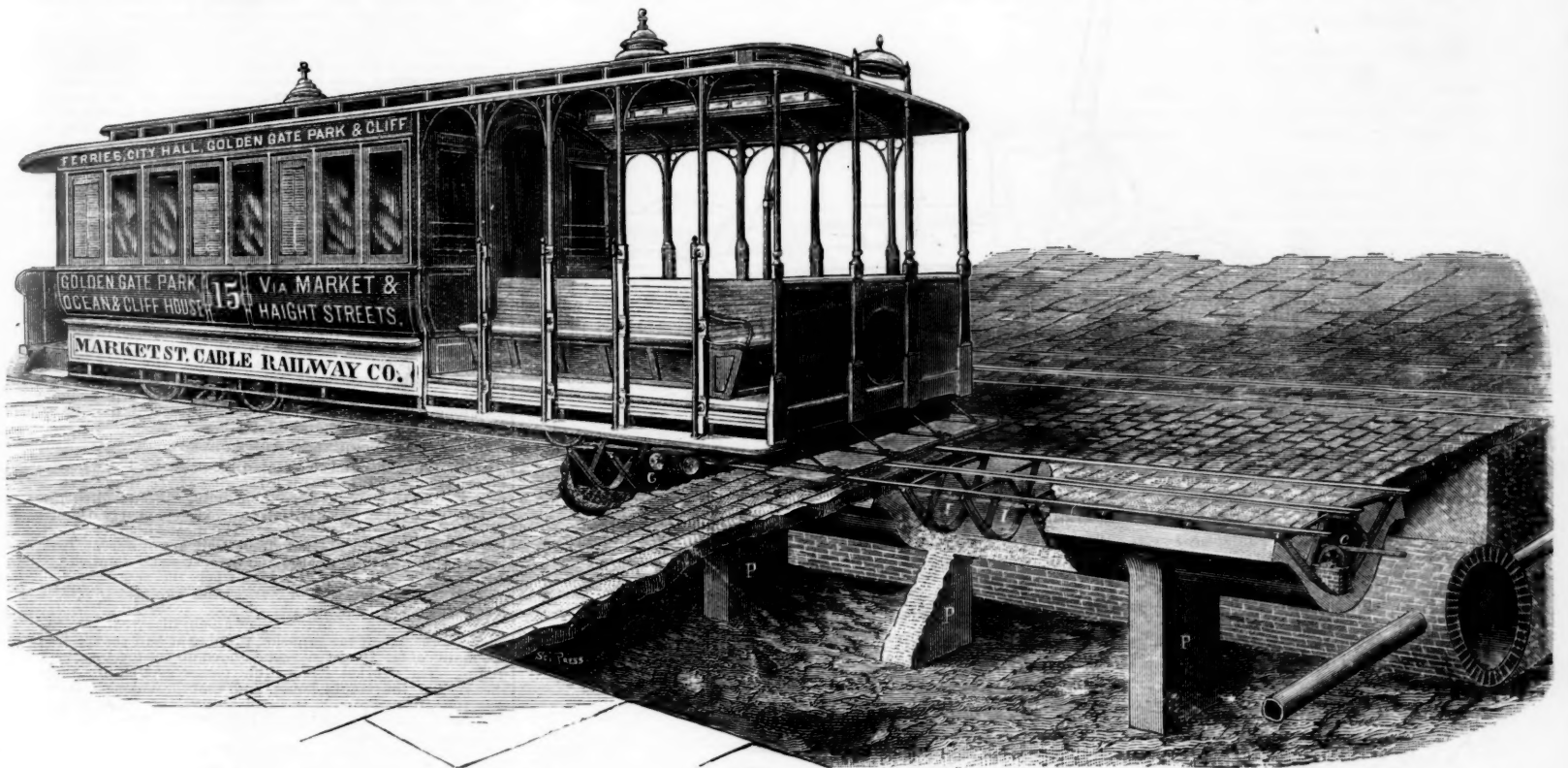


Fig. 4.

SECTION OF ROAD-BED SHOWING FOUNDATION PIERS, TUBE, ROOT'S PATENT CAR, ETC.

cars necessitates some better form of running gear than that in ordinary use, so the system described was adopted.

The cars ride smoother than any horse car in the city, there being none of the jolting motion so common. The road-bed is so solid and the rails so well joined that the whole road is smooth. The cars are well lighted by end and centre lights, and brilliant head-lights are used in front, which light up the street far ahead. There is a large gong outside and on top of the car in front, which, while it sounds a loud alarm, is not heard so much by the passengers as by those it is intended to warn. The engineers and conductors are uniformed neatly, and during the hours when crowds prevail, there is an extra conductor or collector put on the forward car.

It is a mistaken idea that these cars can run no slower than the cable. By reducing the grip pressure, by means of the level, the cable slips along and the car does not move so rapidly; in fact, it may be slowed to a snail's pace, almost, while waiting for a team to get out of the way; and the starting-up is so gradual that no jerk is felt.

Among other peculiarities in the construction of the cars is that of the fender or "kid-catcher," for picking up any stray youngsters who may fall on the track. It will not do to put a fender or catcher on the car itself, as the car has a considerable range of movement from variable loads and the plunging motion caused by inequalities of the road. The fender cannot be, therefore, readily carried at a fixed distance from the ground.

The method adopted is to secure to the forward edge of the rigid truck frames in front of the wheels a plank or frame extending in front of the car itself. It extends across the whole width of the car, and is not over two or three inches above the surface of the track. Knees or braces secure it firmly to the truck frame. The front edge is rounded. The construction of this part of the car is such as to lessen danger in case of persons falling in front.

We give herewith two engravings, figs. 5 and 6, showing the details of the running-gear of these cars. The rear truck, fig. 6, carries the track brake, which is between the wheels on each side. In addition there are the usual wheel brakes. The forward truck fig. 5, carries the grip and brake levers. A rod, shown in fig. 6, connects the rock-shaft of the track-brakes with the hand lever on the front truck. It will be seen that these trucks are similar to those in use on steam

grip is released he can slow down with the wheel brakes or stop suddenly with the track brake. In addition, the conductor can operate the wheel brakes on the rear part of the car. The engineer can throw down the track brake on the rear part of the car and lock the four wheels on the forward part at the same time.

THE GRIP.

The most important appliance on this class of roads is the gripping attachment, or grip, by which connection is made and unmade between the cable and the car. It is necessary to have a gripping apparatus simple in construction, with as much as possible of its mechanism above ground, so as to be accessible at all times, and to be carried at a uniform depth below the slot, so as to always maintain its position relative to the slot. In these cars the grip shown at *G*, fig. 4 and 5, and by fig. 7, hangs on the fixed part of the truck, and not on the car itself. The truck is like that of a coach. The grip is between the centre bolster and the forward axle of the truck, and there is but little motion to it, as the dummy man who operates it stands directly over the king-bolt, around which the truck is free to swivel.

The grips of these cable roads are as much a mystery to most people as a steam engine. Men ride behind locomotives and on steamers every day who have no definite idea of the power that moves them. They ride on cable cars day after day and year after year, see a man use a lever to stop and start, but beyond knowing that something grabs the rope, they are in the dark. To describe in detail the operation and construction of a grip would puzzle nearly all. Yet the operation is quite simple, now the idea is worked out, though the problem had many difficulties which only experience and ingenuity have been able to overcome.

The grip in use on this road is one invented and patented by Mr. Henry Root, the Engineer and Superintendent of Construction, and is illustrated by fig. 7. It is formed of two frames, one sliding outside the other. The inner one is secured to the grip-bar of the dummy (or forward part of car) by bolts, and carries the lower jaw, while the outer frame, which slides up and down upon the inner one, carries the upper jaw, the quadrant, the operating lever and adjusting mechanism, and is held in place by guide plates extending across the stationary inside frame, and between which it slides.

The frame carrying the jaws passes through the slot di-

break it. The law prescribes that the slot in the street through which the grip passes must be no more than $\frac{3}{4}$ in. wide, so it will be seen that there can be no spare metal, for there must be some play. This grip works very satisfactorily indeed. The grips were manufactured by William H. Birch, of the California Machine Works, San Francisco, as were also the shears and tighteners.

CONSTRUCTION OF ROAD-BED.

In laying out the plans for this line the experience of other cable roads was carefully considered, with a view, if possible, of providing against difficulties formerly met with. Every detail was studied with the utmost attention. The constructors had themselves built one successfully operating cable road in the city, and were fully acquainted with the requirements. Cable railways are ordinarily constructed of iron ribs of the form of the tube, set at suitable intervals, to which the slot iron or timber, as the case may be, is bolted, and the spaces between these ribs filled with wood to form a continuous tube. Outside and independent of this tube the rails are laid, supported on short ties or other foundations, and connected horizontally with the iron ribs by short bolts or rods, but are liable to settle by the undermining of their foundation without regard to the tube or the other rail of the track. This will frequently occur by the renewal of the paving outside of the track, the introduction of house-connections with the main sewers, or other disturbances of the track. This settling causes great inconvenience.

It was determined, in building this road, to form a single rigid structure, by connecting the rails and slot-irons by yokes, and uniting the whole by employing concrete.

The engraving, fig. 4, shows plainly how the road-bed has been made. The main tie or yoke connecting the opposite rails, shown at *I*, fig. 4, is formed of old railroad T-rail, but in suitable shape, head down. It embraces the tube, and has fastened to the ends suitable chairs or plates, to which the rails are secured. From the lower part of the curved yoke extend upward two supports for the slot-irons. The lower ends of these are sufficiently separated to form the necessary width for the tube.

Tie-rods connect these supports with the main yokes through the chairs. The two rails, slot-irons, and yoke are then all connected rigidly together as one. These yokes are

placed every three feet along the length of the road. The rails and slot-irons being connected in the same structure, all the parts are maintained in their relative position. Whatever may occur to alter the place of one has no effect, unless the change is sufficient to affect the whole structure.

In building the road, the first thing done was to excavate places every 9 ft., in which was constructed a concrete pier (fig. 4) 16 in. thick by 5 ft. long crosswise the track, on which the main structure stands.

There are altogether some 9,000 of these piers, the foundation of which are 10 ft. below the rails. For a number of blocks at the lower end of Market street the street is made ground; that is, it has been filled in on to the bay mud. In order to get a solid foundation, piles had to be driven to support these piers, so all tendency to settle was avoided.

The piers being built and the trench dug, a section of rail and slot-iron was put in place on the piers, and concrete filled in, filling the space between the rails and slot-iron, and forming a support for the iron-work.

The concrete was not filled in the centre, but a core was temporarily used, so the tube or ropeway was thus formed between the slot-iron supports. As nearly all the weight of the traffic is on the rails, the tendency of the rails to go down is resisted by the deep girder of which the bent tie forms the top and this continuous mass of concrete the bottom. There is no danger of unequal settlement. Fig. 4 shows a section

nished by the constructors to the Cambria Iron & Steel Co., of Johnstown, Pa., which made the first lot. Those on the road under consideration were made here by the Pacific Rolling Mills, from imported Bessemer steel blooms. The rail weighs 38 lbs. to the yard. It is a sort of combination T and street car rail, the object being to get something that could be secured with a fish-plate joint. The rail is 3 in. wide, 2 in. face, and 1 in. of inner flange. It is 3 in. high. The main peculiarity is in the inner part of the T being dropped down to form the flat flangeway for the car wheels.

SUPPORTING PULLEYS.

Every 30 ft. along the road is a grooved supporting pulley; one of them is shown at c, fig. 4. These form the carriers for the rope. The pulley for this purpose is a solid casting, axle and all. It is 15 in. in diameter over the flanges, and 13½ in. in diameter to the bed of the groove where the rope bears. The axles are 1¼ in. in diameter, and 12 in. long. The bearings are 2½ in. long. A flange, or rib, is cast on the axle to prevent end motion, and it runs in a corresponding groove in the box. The box in which each bearing sets is a lignum-vite block, set in a cast-iron shell which carries the lubricant. That used after comparative test is the Standard Lubricating Compound, made by the New York Refining Co. The shells fit in a cast-iron frame, which rests on a small brick foundation in the tube

liarily shaped shovel or hoe, operated through the grip-slot, pushes the dust and dirt to the opening, where it is readily removed. These plates, complete, cost about \$2 apiece.

THE DEPRESSION PULLEYS.

It must be remembered that in these cable roads, in addition to the supporting pulleys below, which prevent the ropes sagging, there must be also pulleys provided at the crossings of up-grades, to hold the traveling cable down below the surface of the street and within the tube. These pulleys, being above, would necessarily be in the way of the grip on the car, which is also above, if provision were not made to let the grip pass. This is by no means a simple problem, and more or less trouble has been experienced with those in general use. The depressed pulley mechanism on the Market-street road, the first of its kind used, has answered the purpose admirably.

The depression pulleys are usually common pulleys, upon the under side of which the cable passes, and which are placed to one side and passed by a peculiar grip, or adapted to move in some manner that the grip may pass, and then return to position. The method used on the first roads constructed here was to place the cable some distance to one side of the slot in which the grip travels. The grip was then made L-shaped, so as to enable the shank to pass the depression pulleys as the cable was carried by the grip at a fixed distance below the surface of the track. As the grip approaches these pulleys the cable is pressed down clear of them, and the shank passes to one side of the pulley, the L forming an offset. This method is objectionable because the draft is to one side and causes a twisting strain on the shank. A grip with no offset, and passing down vertically without angle, cannot pass depression pulleys arranged in the ordinary way. A different plan was therefore necessitated on this road.

At the proper position under the roadway is placed a horizontal arm, one end of which is pivoted or swiveled in a suitable manner near the slot opening, and the other end of which carries a pulley. This is the depression pulley that holds the cable down. A counterpoise or weight keeps the arm and pulley in their places with relation to the centre of the slot and over the cable. As the car comes along, the grip of course holds the cable down so as to press it out of the groove in the pulley. This leaves the arm carrying the pulley free to swing aside but that it is held by the counterpoise. The shank of the grip, however, begins to press against the side of this arm near its hinged end, and without jar or shock presses the arm and pulley aside. The instant the shank has passed the counterpoise brings the arm and pulley back to its central position again. As the car goes on further the rope gradually swings back up to its normal position and comes into the groove of the pulley again. The frame or arm carrying this pulley is set at a small angle to the plane in which the grip-shank travels, and if any part should become broken, the weight or counterpoise draws the pulley and frame out of the way out of the line of travel of the shank, so there is no danger of any obstacle in the line of travel of the grip. There is no spring to get out of order in this arrangement. It must be remembered, of course, that cars can go only one way on the respective tracks of these cables, running up one track and down the other. The grip always comes one way, and as the arm is set at an angle with the slot and partly crosses it, the grip-shank must come in contact with it just at the right time and push it aside. The arm is about 6 ft. long. This is an ingenious arrangement, and is at the same time both simple and effective.

ROUNDING THE CURVES.

There are several mechanical difficulties to be met with on the curves of cable roads especially where they have to pass around those of 90 degrees or more, with a radius now commonly used in cities with narrow streets nearly or quiet at right angles with each other. The means used for rounding the curve on the Market street road are different from those applied anywhere else, and deserve some detailed description. The curve on this road where the new system is applied is at the junction of Market and Valencia streets, in front of the engine-house.

The main feature is in the use of an auxiliary cable in the curve on the line of the grip-slot, running at half the speed of the main cable. The two streets named do not meet at right angles. The Market street cable passes around its guide sheaves into the engine-house, and that of Valencia street does the same. Between the end sheaves of these respective cables plies the auxiliary one which carries the cars from one to the other.

This auxiliary cable is driven from a 6 ft. V-shaped iron wheel on the engine shaft. Guide pulleys suitably placed lead it out into its tube or rope-way, and back again.

In the curve it is guided by 15 side-bearing coned pulleys. The bases of the cones are downward, so that when the cable is within the jaws of the grip it is opposite the upper part of the conical face, and there is sufficient space for the grip to travel without touching the sheaves. When the cable is released from the grip, it may settle to the lower or larger portion of the sheave-face. The auxiliary rope is 400 ft. long, and the curve has 80 ft. radius and about 55 degrees of angle.

The diagram, fig. 2, showing the plan of the engines and the guide-pulleys of the various cables shows also the position of the auxiliary cable and the side-bearing pulleys. By examining this it will be seen that the auxiliary cable only runs between one pair of tracks, and propels the cars only from Valencia street around the curve into Market street. It happens that at that point the grade is such that the cars coming from the ferry, when they let go the Market street cable, will run by gravitation around the curve to the point where they can take hold of the Valencia street cable.

There is no need, therefore, of any cable to take them around to the curve when going out to the Valencia street end of the road. On the return, however, they are on the up-grade, and there the auxiliary cable comes into play. A slight bend or turn in the track out of its regular line swings the car and grip to one side, so that the cable passes out of the side grip from between the jaws. The momentum of the car carries it on a few feet to the point where the auxiliary cable is running, and this cable passes into the side of the grip, the jaws of which are open to receive it. By the proper movement of the lever by the dummy-man the grip-jaws close on the cable, and the car is drawn around the curve. As it reaches the end of the auxiliary rope another curve or swing in the track swings the grip away from the rope, the jaws being opened for the purpose. The momentum of the car carries it a few feet, to the point where the grip may take hold of the main line cable, and continues on its way. The cars have only a space of about 8 ft. to travel by momentum. The distance they travel on the auxiliary rope is about 120 ft.

At proper points on the roadway are iron plates with block letters, with the words "let go," "stop," etc., so the engineer will know exactly where to manipulate the grip and brakes. At night the big headlights show these plates plainly.

Experience proves that it is impracticable to move cars around short curves at the same rate of speed at which the cable should travel on straight lines, as the sudden change of direction would have an unpleasant effect upon passen-

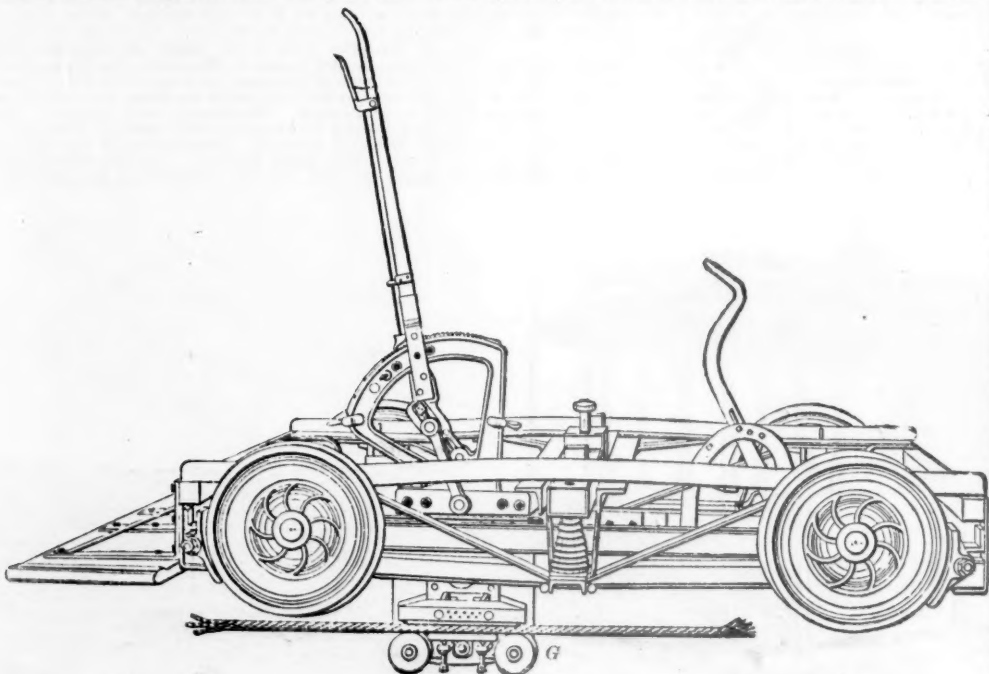


Fig. 5.
FORWARD TRUCK, WITH GRIP, BRAKE LEVER AND FENDER.

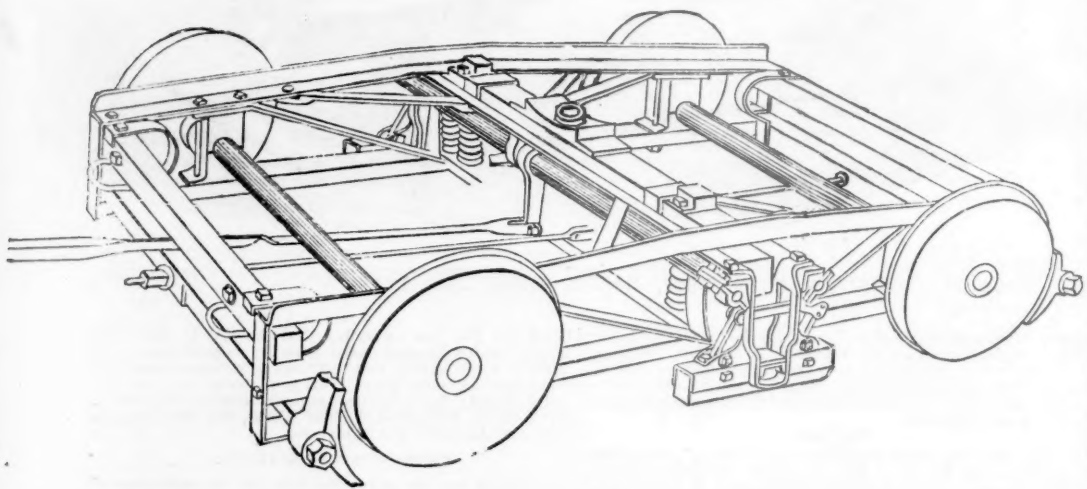


Fig. 6.
REAR TRUCK SHOWING TRACK-BRAKE.

of the road-bed with these piers. The soil in which the road is built is sandy.

In building this road, over 40,000 barrels of Portland cement were used for the concrete. There were 25,000 ribs or yokes used also. Of the steel channel-rail that forms the slot about 1,000 tons were consumed.

The form of this slot-iron is peculiar. It is not an angle iron in the ordinary sense. The top part is 2½ in. wide and the inside or lower portion is 5 in. deep and ¾ in. thick below the flange. It is bolted on to the upright of the ribs. The upright parts of the two slot-irons are wider apart at the bottom than on top. The edges of the iron are ¾ in. apart at the top and 5 in. at the bottom, although only 5 in. deep, the slope being divided between the two. They slope back almost 2 in. in 5. This gives room below for the straps on the grip.

By building the whole road on piers a very firm foundation was obtained, and chance of any settling obviated. If the street was dug away this structure would remain on its 9,000 piers, like one of the old aqueducts. A double purpose was served by this. People wanting to make sewer connections or connect with water or gas pipes can do so without disturbing the road. They run all such connections between the piers, and even if careless workmen fail to make all solid again, the road does not suffer.

THE RAIL.

The rail used on this road is peculiar in shape, and is the same put in the California Street Railroad in 1877. The form was made especially for that road, drawings being fur-

or rope tunnel. There are two side walls that the edge of the frame rests on, leaving a clear passage-way under the pulley of some three inches. Each of these supporting pulleys weighs about 40 pounds. They last a long time and are seldom broken.

It is necessary to have these pulleys readily accessible, so over each one is a removable plate, which it took some ingenuity to devise, since the plate must be secure in its place, must form no obstruction to traffic, and stand heavy blows, and at the same time must be constructed so as to be taken up readily for oiling the pulley and cleaning the ropeway. The plate is 12 by 16 in. and of flat ¾-in. wrought iron. On the under side, running lengthwise the centre, is a channel-iron truss for the truss straps, three of which cross it. One end of this channel-iron truss projects past the plate and nips into a recess in the cast-iron frame. The other end comes flush with the plate, and a cast-iron hook or dog drops or latches into the recess formed by the channel-iron, and holds the plate in place. The latch or dog has a weight formed on it, and hangs in the cast-iron frame out of the way under the pavement. It is automatic in its action, and cannot be disengaged by accident. The top of the plate has numerous rivet heads to roughen it, and secure the truss and straps. The plate is subject to very heavy blows, so no rings or loose lifting arrangements can be used. Two holes are bored in the plate by which the hook is disengaged and it is lifted. The pulleys can then be oiled. The tube is also cleaned out through these openings. A man with a pecu-

whether the earnings, or the profits rather, on this transcontinental traffic exceed the profits that were made on it when it was carried by the company's steamers between Portland and San Francisco. As the profits of the steamer line were less than \$30,000 in October last year (and this was not all transcontinental business by any means), net earnings at the rate of \$140 per mile from through traffic over the 214 miles between Portland and Wallula would balance them, but of course would not be as advantageous company, because it has now to earn interest on the cost of the railroad, as well as on the cost of the steamers. But much more than \$30,000 a month (the profits of the steamer line) might, it would seem, be made on the transcontinental traffic over the line between Portland and Wallula, allowing for the increase of this business which will be caused by the existence of the railroad. The steamer line, it seems, made a profit of but about \$37½ per mile per month last year; it will not take very large profits on the railroad, though but one-fourth as long as the steamer route, to balance a total loss of this.—EDITOR RAILROAD GAZETTE.

THE SCRAP HEAP.

Locomotive Building.

The Ohio & Mississippi shops in Vincennes, Ind., under General Master Mechanic J. H. Setchel, are building four new locomotives with 18 by 24 in. cylinders and 68 in. drivers. The boilers are 50 in. in diameter, the outer shells of 7-16 in. steel, and are intended to carry 160 lbs. steam pressure. Two of them will be finished in January, and the other two soon afterward. There have recently been added to the tools in these shops a 16½-in. slotter, a very fine radial drill, a planer 54 by 55 in. with 18-ft. bed, all from the Machine Tool Works of Philadelphia, also a double-head wheel lathe from Bement, and a Cleveland flue-welder.

Car Notes.

The car works of J. B. Gill, Jr., in Allegheny, Pa., are building 30 tank cars for the Continental Oil & Transportation Co., of California.

The Bellefonte Car Works at Bellefonte, Pa., are now offered for sale at \$27,500. The buildings are large and well equipped with tools, and there is a water power belonging to the works capable of running all the machinery. The shops have a capacity of 8 box cars a day.

The Dickson Manufacturing Co. in Scranton, Pa., is building a number of snow plows for the Hawley Steam Snow Excavator Co., of Rochester, N. Y. They are of the Hawley patent, which was tested to some extent last winter.

Bridge Notes.

Mr. Lindenthal, C. E., has just completed plans for a suspension bridge over the Youghiogheny River at McKeesport, Pa. It is to be a considerable extent modeled after the Sixth street suspension bridge in this city. It will be 700 ft. in length between abutments, with two channel piers, 320 ft. apart, and with floor 41½ ft. above a full stage of water. The two towers will be 105 ft. in height and of ornamental construction. The cables will be of steel wire, patterned after those of the Sixth street suspension bridge. It will cross the river at the foot of Third street, McKeesport, and be used exclusively for vehicle and passenger traffic. Work has already been commenced, and the structure is expected to be completed by July, 1884.—Pittsburgh Railway Reporter.

The Pittsburgh Bridge Co. is running on orders which will keep the works busy all through the winter.

Clarke, Reeves & Co., at Phoenixville, Pa., are building a number of bridges for the new Louisville, New Orleans & Texas road.

Iron Notes.

The Tennessee Coal, Iron & Railroad Co. has closed a contract with G. B. Curting & Co. for mining 100,000 tons of iron ore a year for six years. The company's furnace at South Pittsburgh, Tenn., is making 700 tons of pig iron a week.

The Union Iron Works are building new and extensive mills on the Potrero in San Francisco.

Some days ago the Pittsburgh Steel Casting Co. made a successful experiment in rolling shaped blooms for deck and I-beams from square ingots weighing 2,600 lbs. each, thus reducing the section from 125 square inches in the ingot to 54 square inches in the shaped bloom. They were just sixty minutes in accomplishing this, in which time the cast steel is finished into a steel bloom. They claim that with additional machinery it could have been shaped into a finished beam in less than 15 minutes.—Pittsburgh American Manufacturer.

The Superior Rail Mill in Pittsburgh, owned by the Klonan estate, has shut down on account of the low prices of rails.

The Cambria Iron Co., at Johnstown, Pa., gives notice of a general reduction in the wages of its workmen.

The Cleveland Rolling Mill Co., in Cleveland, O., has taken a contract for 1,200 tons of 56-lbs. steel rails for the Cincinnati & Eastern road. This company has orders enough on hand to keep its rolling mills at work for several months.

The Cuyahoga Forge & Iron Co., at Cuyahoga Falls, O., is putting in a train of rolls for making large sizes of hollow stay-bolt iron.

Manufacturing Notes.

The Westinghouse Machine Co., in Pittsburgh, last month sold four of the Westinghouse automatic engines, of from 40 to 60 horse-power, to the Philadelphia & Reading Coal & Iron Co. The company also sold engines to the Arthur Coal & Lumber Co., the Pacific Rolling-Mill Co., and others, and a number, of from 50 to 65 horse-power, to electric light companies in New York, Brooklyn, Savannah, Buffalo, Cheyenne and other towns. The shipments for the month included 73 engines, costing nearly \$50,000. One engine, of 20 horse-power, was sent to the Senghi Woolen Mills in Japan.

The Newton Machine Tool Works in Philadelphia recently furnished the Baldwin Locomotive Works with a pair of improved driving-box shaping machines, which have proved so satisfactory that a second pair was ordered and is now nearly completed.

The Iron City Nut Lock Co. has been organized in Pittsburgh with \$150,000 capital. H. W. Oliver, Jr., is President; George B. Edwards, Vice-President and Treasurer; John Noble, Secretary.

The Chicago Die & Machine Works have recently shipped a car-wheel grinding machine to the Northern Pacific road. Williams, White & Co., in Moline, Ill., have recently completed for the Indianapolis Bolt & Forge Co. a large steam hammer.

The Rail Market.

Steel Rails.—The Iron Age says: "The transactions of the past week have been comparatively limited, notwithstanding

ing the rumors prevalent of very large sales. Possibly 50,000 tons have been placed during the past week, but the real quantity is under that figure rather than over it. The prices received have varied from \$35 to \$37 at mill, according to location of mill, time of delivery and size of order. We understand that the Edgar Thomson Steel Works have made several provisional sales of rails, conditioned upon their men desiring to work at the reduced rate of wages rendered necessary by \$35 rails. The Pittsburgh Bessemer Works are entirely out of the market for rails at present prices and will cease to manufacture them under prevailing conditions. The materials cannot be bought and rails made with the present prices of labor. We have learned that two of the leading Eastern steel rail companies have been offered a large contract for rails at \$35 for delivery in the winter of 1884-85, but both were declined, thus indicating that they believe bottom has been reached."

Rail Fastenings.—The market is very dull, with few sales, and prices nominally unchanged.

Old Rails.—The market for old iron is firmer, with many inquiries. Sales are reported in Philadelphia at \$24 per ton for American tees and \$23 to \$23.50 for foreign.

Blown off the Siding.

At Grove's station, near the Summit on the Rochester & Pittsburgh Railroad, Monday night, a car which stood on a siding was blown by the wind upon the main track, and a freight train which came up nearly ran into it. The siding is provided with a safety point, but some one had broken the lock on the switch, so that when the car ran off the siding it did not go upon the "blind." The circumstance illustrates the uselessness of safety appliances on railroads when the agency that operates them is human and so often errs and is negligent or careless.—Rochester (N. Y.) Post-Express, Nov. 14.

The British Steel Rail Trade.

London Iron of Oct. 26 says:

"The outlook in the immediate future before steel rail manufacturers is grave in the extreme. Prices, which have fallen almost uninterruptedly since the beginning of 1882, are now at a lower figure than they have touched since the midsummer of 1879. According to report, one of our southern railways has given out within the last fortnight a contract for about 4,000 tons of steel rails at a price under £5 per ton delivered in the Thames; and it is difficult to see how the makers can realize from this more than £4 10s. per ton at their works, if even that amount will be left to them after paying freight and other charges. This is bad enough; but it is by no means such a desperate state of matters as was described in the sensational story to which a cotemporary gave prominence about two months since. It shows, however, that prices are still tending downward, and we are afraid that they have not yet reached the bottom. So far as can be judged at the moment, balancing the probable demands of consumption against the power of production, the next year or two will witness a sharp struggle for existence among steel rail makers. Persons well versed in the iron trade look upon the steel rail branch of it as the one before which the most gloomy prospect lies. It behooves manufacturers, therefore, to study the situation carefully, and not, ostrich-like, to blind themselves to the facts that surround them, and drive on in a happy-go-lucky fashion, trusting that things will improve."

The cause of the existing state of things ought to be well known to every one connected with the iron trade, yet it would appear from the policy pursued by many manufacturers that they are oblivious of it. Over-production lies at the root of the evil."

A Stone Bridge Over the Mississippi.

A dispatch from St. Paul, Minn., Nov. 17, says: "The first and only stone bridge across the Mississippi River was completed to-day. It is the St. Paul, Minneapolis & Manitoba Railway viaduct, spanning the river just below the Falls of St. Anthony. It is a massive stone structure, stretching to the east across the river, curving at first slightly to the left in a graceful sweep and then running at right angles to the stream, directly to the east side landing, the whole course being 2,100 ft. The upper surface of the bridge presents to the view a smooth stone roadway, carrying two tracks on four lines of steel rails, and walled in on either side by heavy blocks of stone, high enough across even enough to prevent a train from leaving the bridge, even should it be derailed. The viaduct crosses the river with 23 arches, 16 spans of 80 ft. each. The material is granite and magnesian limestone. The width is 28 ft. over all, and the height from the springing point of the arches to the top is 50 ft. 6 in. One caisson required six months' work before stone-laying could begin. Two hundred men have been employed on the bridge, and three lives have been lost during its construction. The cost was \$990,000. The bridge was built for passenger traffic, and is to be used by the Manitoba northern lines, and possibly by the Milwaukee. The possibility of running at full speed over it will result in reducing the time between Minneapolis and St. Paul from 30 to 20 minutes."

ANNUAL REPORTS.

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Danbury & Norwalk.

This company owns a line from South Norwalk, Conn., to Danbury, 23.8 miles, with an extension from South Norwalk to Wilson's Point, 2.7 miles, and branches to Ridgefield, 4 miles, and to Hawleyville, 6 miles, making 36.5 miles in all. The report is for the year ending Sept. 30.

The company has 7 locomotives. The passenger equipment consists of 11 passenger, 2 combination, 2 mail and baggage and 2 baggage and smoking cars.

The general account is as follows:

Stock.....	\$600,000.00
Bonds.....	650,000.00
Bills payable.....	50,000.00
Profit and loss.....	77,568.70
Total.....	\$1,377,568.70
Road and equipment.....	\$1,358,751.40
Materials.....	13,900.51
Accounts.....	4,068.23
Cash.....	728.56
Total.....	1,377,568.70

The funded debt consists of \$200,000 first mortgage 7 per cent. bonds, \$200,000 second mortgage 7 per cent. bonds and \$250,000 consolidated 6 per cent. bonds, the interest charge being \$43,000 yearly.

The earnings for the year were as follows:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Passengers.....	\$101,096	\$93,565	I.	\$7,531 8.0
Freight.....	102,552	98,540	I.	4,000 4.1
Mail, etc.....	8,086	8,882	D.	796 8.0
Total.....	\$211,734	\$200,993	I.	\$10,741 5.0
Expenses.....	150,050	137,839	I.	12,211 8.8
Net earnings.....	\$61,684	\$63,154	D.	\$1,470 2.3
Gross earn. per mile.....	5,801	5,507	I.	294 5.0
Net.....	1,000	1,790	D.	40 2.3
Per cent. of exps.....	70.87	68.58	I.	2.29

The increase in expenses was due to a large increase in train mileage and in passengers and freight carried last year.

The income account is as follows, condensed:

Net earnings, as above.....	\$61,683.95
Bonds sold.....	150,000.00
Decrease of materials and accounts paid.....	8,878.39
Cash on hand, Sept. 30, 1882.....	354.36
Total.....	\$220,916.69
Construction and equipment.....	\$52,166.98
Notes paid.....	97,000.00
Interest and taxes.....	51,925.42
Dividends, 2½ per cent.....	14,967.50
Accounts due, balance.....	4,068.23
Cash, Sept. 30, 1883.....	728.56
Total.....	220,916.69

Rates to several points have been reduced by the competition of new lines. The extension to Wilson's Point has brought considerable business to the road, in the carriage of passengers to the steamboats and in freight, especially coal, lime and ice.

Improvements have been made in the Norwalk station and new bridges built at Norwalk and Winnipauk. There were 11,325 new ties used in renewals.

Cheshire.

The following statements for the year ending Sept. 30 are from the statement made by this company to the Massachusetts Railroad Commission.

The company owns a line from South Ashburnham, Mass., across New Hampshire to Bellows Falls, Vt., 53.62 miles. It leases the use of the Fitchburg Railroad from South Ashburnham to Fitchburg, 10.39 miles. It also leases the Monadnock road, from Peterboro, N. H., to Winchendon, Mass., 15.82 miles, making a total of 79.83 miles worked. The main line is all laid with steel rails. There are 16.67 miles of sidings.

The equipment consists of 31 locomotives; 23 passenger and 11 baggage cars; 461 freight cars and 33 road and service cars.

The general account is as follows:

Common stock.....	\$53,300
Preferred stock.....	2,100.00
Funded debt.....	800,000
Accounts and balances.....	25,272
Profit and loss, balance.....	8,071
Total.....	\$2,986,643
Road and equipment.....	\$2,717,535
Cash and cash assets.....	269,108
Total.....	2,986,643

The funded debt consists of 6 per cent. plain bonds, of which \$250,000 will mature in 1896 and the balance in 1898. The interest charge amounts to \$48,000 yearly.

The traffic for the year was as follows:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Train miles.....	125,528	122,933	I.	2,595 2.1
Passenger.....	366,115	323,328	I.	42,787 13.2
Freight.....	76,434	38,850	I.	37,584 96.6
Other.....				
Total.....	568,077	485,111	I.	82,966 17.1
Passengers carried.....	165,862	162,102	I.	3,760 2.3
Passenger-miles.....	5,192,211	5,010,192	I.	182,019 3.6
Tons freight carried.....	555,163	546,449	I.	8,714 1.6
Ton-miles.....	30,532,956	30,032,900	I.	500,056 1.7
Av. train load.....				
Passengers, No.....	41	41		
Freight, tons.....	83	93	D.	10 10.7
Av. rate.....				
Per passenger-mile.....	3.05 cts.	3.24 cts.	D.	0.19 ct. 5.8
Per ton-mile.....	1.34 "	1.36 "	D.	0.02 " 1.5

Through business furnished 75.9 per cent. of the passenger

traffic, and no less than 96.7 per cent. of the freight traffic.

The earnings for the year were as follows:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Freight.....	\$428,990	\$423,828	I. \$5,162	1.2
Passengers.....	169,108	162,274	I. 6,834	2.4
Mail, etc.....	39,426	38,973	I. 453	1.2
Total.....	\$637,524	\$625,075	I. \$12,449	1.5
Expenses.....	473,438	449,871	I. 23,567	5.2
Net earnings.....	\$164,086	\$175,204	D. \$11,118	8.1
Gross earn. per mile.....	7,948	7,830	I. 118	1.5
Net earn. per mile.....	2,018	2,195	D. 177	8.1
Per cent. of expenses.....	74.53	71.97	I. 2.56	...

The increase in expenses was greater than the slight gain in gross earnings, the result being a decrease in net earnings. The income account was as follows:

Net earnings, as above.....	\$164,086.78
Rentals.....	\$53,859.01
Interest on bonds.....	48,000.00
Dividends on preferred stock, 3 per cent.....	63,000.00
Total.....	164,859.01
Deficit for the year.....	\$3,773.23
Surplus, Oct. 1, 1882.....	11,944.23
Surplus, Sept. 30, 1883.....	\$8,071.00

No passengers were killed or injured on the road during the year; one employé was killed, but none were injured. Two other persons were killed and one injured, making a total of three deaths and one injury resulting from the operations of the road.

Boston & Providence.

This company owns a line from Boston, Mass., to Providence, R. I., 44 miles, all double track; the West Roxbury Branch, 5.37 miles; the Dedham Branch, 2.22 miles; the Stoughton Branch, 4.11 miles, and the India Point Branch, 8.05 miles. It leases the Attleboro Branch, 4 miles, making 63.75 miles owned and 67.75 miles worked. There are 44 miles of second track and 46.16 miles of third track and sidings. The report is for the year ending Sept. 30.

The equipment consists of 53 locomotives; 131 passenger and 20 baggage, mail and express cars; 824 freight and other cars.

The general account is as follows:

Stock.....	\$4,000,000.00
Bonds.....	500,000.00
Notes payable.....	360,000.00
Accounts and balances.....	58,029.74
November dividends.....	160,000.00
Profit and loss.....	412,450.91
Total.....	\$5,490,480.65
Road and equipment.....	\$4,896,174.38
Prov., Warren & Bristol stock.....	152,370.00
Union Freight R. R.....	79,014.42
Materials.....	133,764.39
Bills and accounts receivable.....	187,500.39
Cash and cash funds.....	38,662.56
Total.....	5,490,480.65

The bonds are plain bonds bearing 7 per cent. interest and due in 1893. The notes payable are due at various dates, from 1884 to 1889.

The traffic for the year was as follows:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Train miles.....	653,001	598,841	I. 54,160	9.1
Passenger.....	243,108	241,770	I. 1,338	0.5
Freight.....	60,307	48,093	I. 12,214	25.4
Other.....	956,506	888,707	I. 67,799	7.6
Total.....	4,923,426	4,128,299	I. 795,127	19.2
Passengers carried.....	51,399,499	46,344,791	I. 5,054,708	10.9
Tons freight carried.....	735,650	718,500	I. 17,150	2.4
Ton-miles.....	22,132,329	21,398,223	I. 734,106	3.4
Av. train load.....	79	77	I. 2	2.6
Passengers, No.....	91	89	I. 2	2.2
Freight, tons.....	1.88 cts.	1.96 cts.	D. 0.08 ct.	4.1
Av. rate.....	2.83	2.83	I. 0	0
Per passenger-mile.....	2.80 cts.	2.80 cts.	I. 0	0
Per ton-mile.....	2.57	2.70	D. 0.13 ct.	4.9

The large increase in passenger traffic was chiefly due to a general reduction in local rates.

The earnings for the year were as follows:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Passengers.....	\$968,857	\$910,763	I. \$58,094	6.4
Freight.....	606,636	605,221	I. 1,415	3.5
Mail and express.....	51,479	48,325	I. 3,154	6.6
Rentals.....	22,172	20,530	I. 1,642	8.0
Total.....	\$1,609,134	\$1,584,839	I. \$24,295	5.3
Expenses.....	1,323,554	1,232,509	I. 91,045	7.4
Net earnings.....	\$285,580	\$352,330	D. \$66,750	1.9
Gross earn. per mile.....	24,637	23,390	I. 1,245	5.3
Net ".....	5,101	5,200	D. 99	1.9
Per cent. of exps.....	79.30	77.76	I. 1.54	...

The expenses include taxes, which last year were \$91,674, and rentals amounting to \$11,732. They also include \$12,500 for third track (the balance of \$37,500 for third track being charged to profit and loss), \$18,000 for a new iron bridge, and the cost of 4 locomotives, 20 freight and 15 passenger cars, and this company's proportion of 16 new cars for the New York line.

The income account was as follows:

Net earnings for the year.....	\$285,579.69
Balance of interest account.....	\$15,688.97
Dividends paid, 8 per cent.....	320,000.00
Total.....	335,688.97
Surplus for the year.....	\$0,800.72
Surplus, Oct. 1, 1882.....	\$440,066.19
Less charge for third track.....	37,500.00
Surplus, Sept. 30, 1883.....	\$402,566.19

Dividends received from investments were credited to interest account and deducted from interest paid. These dividends were larger than usual, \$17,172 having been received on account of back dividends on Fall River, Warren & Providence preferred stock.

On Jan. 1, 1883, a large reduction was made in suburban fares out of Boston and Providence, and in fares over the whole line. This reduction has led to an increase in travel so great that the increased receipts more than balanced the greater expenses, which was not expected the first year.

The report says: "As is well known, the accommodations of this and other railroads centering in Providence are not equal to the efficient and economical transaction of passenger or freight traffic. The Commissioners appointed by the government of that city have had frequent interviews with the representatives of the different corporations on this subject. As keeping before the stockholders the fact that large outlays must necessarily be made within a few years, and to preserve in a permanent form the history of the approaches toward a settlement of this difficult problem, a communication addressed to the President, bearing date Aug. 8, 1883, has been printed and will be found in the appendix.

"The Commissioners have been told that the directors of this road are willing to recommend to the stockholders, the loans and appropriations necessary for carrying out any

plan which the other roads in interest can reasonably be expected to adopt."

Norwich & Worcester.

This road extends from Allyn's Point, Conn., through Norwich to Worcester, Mass., 66 miles, with a branch one-half mile long forming a connection with the New London Northern road in Norwich, making 66½ miles in all.

The road is leased to the New York & New England Co. at a rental equivalent to interest on the debt and 10 per cent. on the stock. Its accounts are not included in the lessee's reports. The following statement has been published for the year ending Sept. 30:

The equipment consists of 19 locomotives; 10 passenger and 4 baggage cars; 534 freight cars and 12 service cars.

The general account is as follows:

Stock.....	\$2,004,400
Funded debt.....	400,000
Accounts and balances.....	142,485
Profit and loss, balance.....	857,631
Total.....	\$4,004,516
Road and equipment.....	\$3,454,104
Accounts and balances.....	273,107
Cash and cash assets.....	277,305
Total.....	\$4,004,516

The funded debt consists of one issue of 6 per cent. bonds, due in 1897.

The traffic for the year was as follows:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Train miles.....	164,122	162,979	I. 1,143	0.7
Passenger.....	199,743	223,476	D. 23,733	10.6
Freight.....	162,381	121,049	I. 41,332	34.2
Other.....	528,246	507,504	I. 18,742	3.7
Total.....	433,923	423,720	I. 10,203	2.2
Passengers carried.....	7,538,729	7,273,405	I. 265,324	3.7
Passenger-miles.....	612,930	605,553	I. 7,377	2.9
Tons freight carried.....	21,381,574	21,598,654	D. 217,080	1.0
Ton-miles.....	46	45	I. 1	2.2
Av. train load.....	107	97	I. 10	10.3
Passengers, No.....	2.80 cts.	2.80 cts.	I. 0	0
Freight, tons.....	2.57	2.70	D. 0.13 ct.	4.9
Av. rate.....	2.80 cts.	2.80 cts.	I. 0	0
Per passenger-mile.....	2.80 cts.	2.80 cts.	I. 0	0
Per ton-mile.....	2.57	2.70	D. 0.13 ct.	4.9

Of the passenger-miles 44.4 per cent. and of the ton-miles 61.4 per cent. were of through business. There was a small decrease in freight traffic and also in rates.

The earnings for the year were as follows:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Freight.....	\$548,773	\$586,571	D. \$37,798	6.4
Passengers.....	208,100	263,798	I. 4,311	2.1
Mail, etc.....	28,724	58,492	D. 29,768	50.8
Total.....	\$785,706	\$848,861	D. \$63,155	7.4
Expenses.....	498,467	480,260	I. 18,207	3.8
Net earnings.....	\$287,239	\$368,601	D. \$81,362	22.1
Gross earnings per mile.....	11,815	12,765	D. 950	7.4
Net ".....	4,319	5,543	D. 1,224	22.1
Per cent. of exps.....	63.44	56.58	I. 6.86	...

There was a considerable decrease in gross earnings, accompanied by a small increase in expenses, the result being a large loss in net earnings.

The income statement is as follows:

Net earnings, as above.....	\$287,239
Rentals paid.....	\$38,160
Interest.....	26,239
Dividends, 10 per cent.....	259,780
Total.....	322,179

Loss to lessee for the year..... \$34,940

The rental paid is for the use of the New London Northern tracks.

For the previous year there was reported a surplus of \$46,953 over all charges; showing a loss of \$81,893 last year.

Oregon Railway & Navigation Co.

At the close of its last fiscal year, June 30, 1883, this company worked the following transportation lines:

	Miles.
Ocean Division steamer line, Portland to San Francisco.....	670
Puget Sound steamboat lines.....	238
River Division, steamboat lines on Columbia River and tributaries.....	967
Total steamer lines.....	1,575
Railroad lines:	
Portland to Walla Walla.....	244
Walla Walla to Texas Ferry.....	56
Dayton Branch.....	14
Walla Walla & Pendleton Branch.....	20
Umatilla toward Baker City.....	122
Old Portage road, Lower Cascades of the Columbia.....	6
Oregonian Railway, narrow-gauge, leased.....	150
Total transportation lines.....	2,187

Additions to the railroad mileage during the year were 41 miles from Portland to Bonneville, completing the line from Portland west parallel to the Columbia River; 78 miles on the Baker City Branch and 6 miles on the Walla Walla & Pendleton Branch, making 125 miles in all.

The company is controlled by the Oregon & Transcontinental Co., which also controls the Northern Pacific. That company has also lately leased the Oregon & California road, which it is extending to the California line. The three companies are therefore worked in one interest and practically under one management, although their organizations and accounts are distinct.

The capital account is as follows, condensed:

Stock.....	\$21,800,283.39
Bonds.....	5,788,000.00
Scrip certificates.....	1,200,000.00
Insurance and renewal fund.....	268,932.44
Bills, accounts and balances.....	1,287,179.82
Profit and loss.....	2,363,856.10
Total.....	\$32,608,251.75
Roads and other property.....	\$28,353,848.55
Stocks and bonds.....	645,710.00
Insurance and renewal fund assets.....	215,866.25
Balance of accounts.....	2,386,456.62
Sinking fund.....	17,976.00
Supplies on hand.....	692,210.00
Bills receivable.....	52,693.71
Cash.....	242,490.53
Total.....	32,608,251.75

Stock account includes \$18,000,000 full stock and \$3,800,283.39 payments received on account of \$6,000,000 new stock. The funded debt consists of 6 per cent. 30-year bonds, all of one issue, which was originally \$6,000,000, of which \$212,000 have been redeemed for the sinking funds.

During the year the issue of \$6,000,000 new stock was made, and was all taken by the stockholders at par. The amount paid by the subscribers to the close of the year was \$3,800,283. When all the subscriptions have paid up, the amount of full paid stock will be \$24,000,000 in all. The assessments still to be called on the new stock are available for new construction during the current year.

The traffic reported for all lines is as follows:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Passengers carried.....	381,758	274,318	I. 107,440	31.9
Passenger-miles.....	41,847,774	38,790,085	I. 3,057,689	7.9
Tons freight carried.....	690,639	691,154	D. 515	0.7
Ton miles.....	167,667,870	294,636,447	D. 36,968,577	18.1
Average rate:				
Per passenger mile.....	3.15 cts.	2.79 cts.	I. 0.36 ct.	12.6
Per ton-mile.....	3.01	1.79	I. 1.22	12.1

There was a large decrease in wheat and flour carried, the wheat crop of Eastern Oregon having been a partial failure last year on account of unusually dry weather. The wheat and flour carried were less than half the tonnage of the preceding year.

The earnings and expenses of the company's lines were as follows:

	Earnings.	Expenses.	Net earn.
Ocean Division.....	\$980,036	\$570,025	\$410,014
Puget Sound Div.....	245,449	170,747	74,702
River Division.....	1,010,145	831,479	178,666
Railroad Div.....	2,810,402	969,964	1,840,418
Narrow-gauge Div.....	54,478	81,936	\$27,458
Total.....	\$5,100,513	\$2,624,171	\$2,476,342

*Deficit.

The Ocean and Puget Sound steamer divisions and the Railroad Division show gains, the Railroad Division having a very large increase. The River Division shows a large decrease, caused by the transfer of business to the Railroad Division parallel to the Columbia River.

A comparative statement for all the lines is as follows:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Passengers.....	\$1,320,035	\$1,084,568	I. \$235,467	21.7
Freight.....	3,408,179	3,675,175	D. 266,996	7.3
Mail and express.....	154,510	96,832	I. 57,678	59.4
Miscellaneous.....	217,789	91,305	I. 126,484	138.3
Total.....	\$2,476,342	\$2,476,342	I. \$152,533	3.1
Expenses.....	2,624,171	2,544,866	I. 79,305	3.1
Net earnings.....	\$5,100,513	\$2,403,114	I. \$73,228	3.1
Per cent. of exps.....	51.40	51.40	I. 0	0

The loss in freight was chiefly due to the loss in wheat tonnage referred to above. The freight which nearly made up this loss was chiefly on the Ocean line.

The income account, condensed, was as follows:

Net earnings for the year.....	\$2,476,341.91
Interest and rents received.....	85,167.28
Total.....	\$2,561,509.19

Interest.....	\$444,270.00
Rentals.....	145,429.28
Sinking funds.....	71,730.00
Taxes, etc.....	89,795.35
Dividends.....	1,584,000.00
Total.....	2,335,224.63

Surplus for the year.....	\$226,284.56
Received on account of new stock.....	5,418,213.57
Sale of real estate and other property.....	324,876.61
Total.....	\$5,969,374.74

New construction and equipment.....	\$5,022,250.29
Sinking fund.....	71,730.00
Total.....	5,093,980.29

Balance.....	\$875,394.45
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The Columbia River line was completed from Portland to the Cascades Oct. 3, 1882, the expenditure during the year on this line having been \$1,112,912. The report says:

"During two years' experience in operating the Columbia River line, it became apparent that without additional protection of the road-bed from injury by the regular summer floods, economical operation was hardly practicable. Upon the recommendation of the Engineering Department the management authorized such measures as would insure absolute protection.

"Accordingly, during the past year the track was strongly riprapped for a distance of 207,670 lineal feet, between Portland and Wallula. The line was also considerably improved by the reduction of heavy curvatures and the substitution of steel in place of iron rails for a distance of 32 miles. For these various betterments \$509,554 was expended.

"During the year the Baker City Branch was fully completed to a point near the summit of the Blue Mountains, and the work between that point and the southern slope of the mountain well opened. Owing to the scarcity of railroad labor, caused by the construction of other lines, the contractors experienced considerable difficulty in obtaining the requisite working force. This difficulty has been overcome since the opening of the present working season.

"Every effort is being made to complete this line to a connection with the Oregon Short Line at the earliest practicable moment. There are now finished 78 miles of the line, including by far the heaviest portion of the work, and 65 miles are open to traffic.

"The total expense on the Baker City Branch during the year was \$2,018,735, which includes rails for the entire distance.



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EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

TROUBLES OF THE OMAHA POOL.

The Omaha pool is perhaps the oldest and the most uniformly successful of the co-operative associations of the railroads. It was organized in 1870, about two years after the completion of the first Pacific railroad line. There were then three lines competing for the traffic, and until about a year ago there was no addition to them, though the opening of lines from Omaha to St. Louis enabled other roads to compete with the three Chicago roads for part of the Pacific and other Omaha traffic. Still the traffic was a simple one compared with that dealt with by some of the co-operative associations. It was traffic between two points only, Chicago and Council Bluffs, and not that from a score of points to a score of points, as in the Southern Association. The different lines were quite similar in length and in the quality of the service they were able to render, the shortest being 490 and the longest 500 miles long. Their managers were all in one city and had confidence in each other. The result was that with simply a verbal agreement and no organization the business was harmoniously conducted, to the very great advantage of all concerned, and to the apparent satisfaction of the communities served, except when the quarrels of the railroads gave the Missouri River towns further south, as St. Joseph and Kansas City, much lower rates than those to Council Bluffs and Omaha, thus enabling the first-named places to sell goods to better advantage than the last named. Irregularities in rates seem to have been uncommon, but something more than a year ago, lines multiplying, and the business becoming more complicated, an organization was completed, formal agreements signed, and a Commissioner appointed to supervise its affairs. About a year ago the Chicago, Milwaukee & St. Paul completed a new line between Chicago and Council Bluffs, as short as the shortest of the old ones. It was granted an equal share of the freight and came into the freight pool directly, but held off from the passenger pool, probably because the other roads would not give it one-fourth of the passenger business. During the St. Paul railroad war a year ago it cut the Council Bluffs tickets to offset the Rock Island's cut on St. Paul business. During the same contest the Illinois Central in combination with the St. Paul and Omaha began to carry Omaha business at reduced rates, and after a time succeeded in obtaining a share of the freight in the pool. The Wabash has now a through line from Chicago to Council Bluffs 564 miles long, which has a share of the freight in the pool, we believe, but has not as yet put on through passenger trains.

It was reported before the St. Paul and the Wabash had been completed that the other roads had agreed

to give the new comers an equal share of the traffic, which would, one might think, be all they could possibly expect to get at full rates. But the St. Paul road, after it has been in the pool a year, shows its dissatisfaction with its operation by giving the required 30 days' notice that it will withdraw from it Dec. 15.

The immediate cause is said to be that the St. Paul road has had much more than its proportion of the live-stock shipments, and in accordance with the agreement had to pay over to the other roads about \$38,000 for its excess in October. The other roads, it is said, charge that the large live-stock shipments by the St. Paul were due to rebates granted by it. It says, on the contrary, that it charged full rates, and that it carried most of the live stock because the shippers "preferred it."

It is not at all likely that a body of shippers accustomed for years to ship by other roads should all at once prefer a new road without some motive other than can be afforded by the very slight difference in accommodations, time, etc., that can exist on four roads so nearly alike as those between Chicago and Omaha. A sufficient motive would be the hope of breaking the live-stock rates. This is a common enough proceeding on the part of large shippers, who, when all the lines strictly maintain rates, often, by concentrating their shipments on one line, can make the others believe that that one is cutting rates. But the trick is too transparent usually, and most of the combinations guard against it by providing for a transfer of traffic; and the lines in the Joint Executive Committee have a joint agent to distribute the shipments among the different lines, and charge a higher price when the stock is not shipped in accordance with the directions of that agent.

Whether the St. Paul's large live-stock shipments from Council Bluffs are caused by a union of shippers intended to break rates or not, it is not at all likely that it will long continue to get a larger share of this or any other traffic than it is entitled to in the pool. The other three short lines from Council Bluffs to Chicago are certainly just as good, and, at some rate or other, each will be bound to have as much of the traffic as any other road. What answer can their managers give to the owners of the roads if they do not? A road with natural disadvantages may be content with a smaller share of a traffic than its better situated competitors. If it suffers from artificial disadvantages we must expect it to remove them as quickly as possible, and then claim and get as much as its equals; but if it is on an even footing to begin with it is idle to expect that it will be content with less than its rivals obtain, and its managers feel that to get less is a certificate of incapacity for them.

But though the ostensible occasion of the Milwaukee & St. Paul's withdrawal was a matter relating to freight traffic, it is questionable whether its dissatisfaction is not due to the conduct of the passenger business. It has never been allotted a share of this business. A year ago it was reported that it preferred to keep out of the passenger pool, that it might have freer play in "building up a business." It seems more probable that it kept out because the other three roads, which had been twelve years in the field, were not willing to give the new-comer a share equal to their own, while it would take no less. Doubtless it would be next to impossible that a new road not known to the general public as a line between Chicago and Council Bluffs should in its first year secure as much as the old ones, without cutting rates or by large commissions securing the services of a great many agents to work for it. But, on the other hand, it is not easy to see why a road as short as any other between the two places, with as numerous trains, carrying passengers as comfortably, rapidly and promptly, should not eventually secure as many passengers as any other road. And if it had defects which prevented its rendering equal service, we should expect to see them removed as quickly as possible. That is, there are about the same reasons why the St. Paul should get as many passengers as any other road as there are why it should not carry any more freight or live stock than any other road.

However this may be, the result of the Milwaukee & St. Paul's competing outside of the pool for the Council Bluffs road has cost the roads in the pool much more than the value of the traffic which, it may be presumed, would have brought it into the pool. The fares have been demoralized throughout the year, and very badly demoralized a large part of the time. Commissions have been paid (and apparently on a large part of the business) as high as \$7 on first-class tickets between Chicago and Council Bluffs, the price of which is \$14.30; and of the \$12.50 second-class tickets \$6.50 has been paid as a commission. Now there can be hardly any kind of settlement that

will not make the condition of this business very much better than this for every one concerned (except the scalpers), and a railroad war would probably not make this particular part of the business much worse. If anything that the St. Paul has done should be the occasion of the mending of this disgraceful state of affairs (which may have been in the first place chiefly due to its efforts to secure "its fair share"), it will have rendered its competitors, and other railroads further east, a most important service.

If the St. Paul leaves the Iowa Trunk Lines Association, there may be no collapse of rates and railroad war as the immediate sequence, but it is not at all probable that rates could be maintained long. The old lines, either separately or in combination, would doubtless make sure of getting their full share of the business, at any rates necessary to secure it. Even under the pool they have been suspicious; out of it, it would be much easier to make them believe that others were not maintaining rates.

As equal sharers in the Omaha traffic it might be said that one road has as much to suffer as another by a railroad war. But the Burlington has a great system of roads of its own in Nebraska, most of whose traffic it gets in addition to its share of the Council Bluffs business. This traffic would be affected by a break in rates.

The traffic affected is large and valuable. The Pacific business via Council Bluffs, it is true, is considerable less than formerly, because much more goes by the Southern Pacific, the Kansas Pacific, and now by the Northern Pacific, which formerly could go only by the Union Pacific; the Colorado traffic is also much less than formerly; but the live-stock business is probably larger than ever before, and the crops of Nebraska are unprecedented. In a season when the corn crop is light on this side of the Missouri the railroads will miss the profits that can be made on the long haul of the trans-Missouri crops, should there be a contest over this business.

But the traffic in this pool might not be the only one affected. We all remember how the St. Paul railroad war last year affected Omaha rates and at one time seemed likely to destroy the profits on the Southwestern business—that to and from Kansas City and other places on the Missouri south of Omaha. The same parties are affected this year. The Rock Island can injure the Milwaukee & St. Paul more than it hurts itself by destroying the profits on St. Paul and Minneapolis business. The Northwestern competes with the St. Paul at scores of places in Illinois, Wisconsin, Minnesota, Dakota and Iowa, as well as at Council Bluffs. Thus a bitter war among the lines to Council Bluffs might largely reduce earnings throughout a vast territory southwest and northwest of Chicago as well as directly west of it.

For the losses consequent upon such a war, the Milwaukee & St. Paul would seem to be less prepared than any of the other three companies. All of them have a large surplus after paying dividends this year; the St. Paul, with great prospects for future years, can have very little margin this year, even if it has profits enough for the 7 per cent. on the common stock which it has paid for a few years past. That it is not generally considered as strong as the other companies is evident from the current prices of the stocks: Burlington, paying 8 per cent., 126½; Northwestern common, 6 per cent., 124; Rock Island, 7 per cent., 120¼; St. Paul, common, 7 per cent., 97.

It is not probable, however, that any of the companies concerned are at all eager for war. On the contrary, no one seems to have any stomach for a fight. The temper of the possible contestants is not at all such as existed last year. If the pool is broken up we may expect endless troubles and frequent or even constant irregularities in rates, but probably not an open war in which a deliberate effort is made to make a rival's business as unprofitable as possible.

CROPS AND TRAFFIC.

The corn crop, according to the report of the Department of Agriculture for Nov. 1, is likely to amount to 1,577 millions of bushels, being at the average rate of 23.1 bushels per acre on the 68,300,000 acres planted. The yield per acre is about 1½ bushels (6 per cent.) less than last year, but the increase in acreage is such that the crop is but 2½ per cent. less. For five successive years the crop has been:

1879.	1880.	1881.	1882.	1883.
1,754,800,000	1,717,400,000	1,194,900,000	1,617,000,000	1,577,000,000

The acreage this year is 9½ per cent. greater than in 1879, yet the crop is 10 per cent. less. With the average yield of 1879 the crop would have been 2,055 millions instead of 1,577. The difference in the yield makes a very great difference in the condition of the farmers and in the wealth of the country. Even with the light yield of last year the crop would have been

1,679 millions. An unusually large proportion of the crop this year is poor in quality.

Of course there may be a poor aggregate crop, and yet a good crop in some sections of country, which will give some of the railroads a very heavy traffic in a bad year. This was true last year, when Kansas and Nebraska had unusually large crops, and Iowa and Illinois very poor ones. The November report of the Department of Agriculture shows that the condition of things in the six great corn states is nearly the same this year as last; the average yield per acre is very large in Kansas and Nebraska—even larger than last year; in Iowa, Illinois, Indiana and Ohio it is small, and in all but Illinois smaller than last year. These six states afford by far the larger part of the corn and hogs marketed, though a great amount of corn is raised in the other states, which import more or less according to their yield. Applying the yields per acre to the acreage reported in these six states last July, we have as the corn crops of these states for five years:

	1879.	1880.	1881.	1882.	1883.
Ohio.....	111,477,000	119,949,000	79,760,000	93,319,000	87,876,000
Indiana....	115,482,000	90,229,000	79,618,000	107,484,000	95,620,000
Illinois....	325,791,000	290,453,000	176,735,000	182,357,000	211,938,000
Iowa.....	292,436,000	299,183,000	173,219,000	175,488,000	199,630,000
Missouri...	275,024,000	169,463,000	93,069,000	170,037,000	161,627,000
Kansas....	105,729,000	196,218,000	76,377,000	144,453,000	172,700,000
Nebraska..	65,460,000	69,508,000	58,913,000	82,478,000	101,770,000
Six states..	1,201,811,000	1,046,064,000	737,759,000	955,596,000	908,973,000
Acre.	33,292,500	33,492,400	34,594,800	33,515,900	35,140,700
Av. per acre....	36.2	31.2	21.3	28.4	28.1

In this group of states, therefore, the average yield per acre is a little less than last year, and the increase of $\frac{1}{2}$ per cent. (43,000,000 bushels) in their aggregate production was made only by an increase of $\frac{1}{4}$ per cent. in the acreage. Their increase in acreage since 1879 is nearly 6 per cent., but their production has decreased in that time 203 millions (17 per cent.). With the yield of 1879 they would have produced 1,283 millions of bushels instead of 998. This was an exceptionally heavy yield, but that of 1880 was not for these states, and that would have made their crop this year about 108 millions more than it is.

But that the result this year is as good as it is due entirely to Kansas and Nebraska, which have 284 millions this year, against 227 last, when their crops were better than ever before. The two successive very large crops which these states have had while other states had light ones, together with the large yield of other crops at the same time, should make them exceptionally prosperous, and benefit greatly the railroads from the Missouri River to the East, and especially those to Lake Michigan, which get a very long haul on Kansas and Nebraska traffic. The road profiting most should be the Chicago, Burlington & Quincy, because of its great system of roads in Nebraska, giving it the local traffic west of the Missouri, while greatly increasing the through traffic over the 500 miles on this side. The other chief beneficiaries are the Union Pacific and the Atchison, Topeka & Santa Fe, with their great systems in this territory which has secured such abundant crops for two years.

Taking the corn crop as a whole, however, it is decidedly a poor one, and will contribute less than usual to the traffic of the country. The fact that it is nearly as large as last year and much greater than in 1881 may prevent its making an unfavorable change in the general business situation, but at all events it will not help to mend it. The traffic which it will afford it not only less than in 1880 and in 1879, but it is distributed over a much larger mileage of railroad and among a greater number of merchants and manufacturers. With all other business increasing as rapidly as it has since 1878, we need something more than the maintenance of the rate of agricultural production. We must produce more, year after year. But the aggregate of the crops of cereals this year is with one exception the smallest for five years. Taking the maximum estimates of the Department of Agriculture for this year (which for wheat is 420 millions and probably 20 millions too great), the production for five successive years has been, in millions of bushels:

	1879.	1880.	1881.	1882.	1883.
2,688	2,688	2,634	2,704	2,686	2,577

We have this year at least 80 and probably 100 millions less wheat than last year, and 40 millions less corn; the gain is chiefly in oats, which is the cheapest of the cereals. Were we to estimate the value of the crops by the prices now and at this time last year, we should find the decrease in their aggregate value to have been much more than the 4 per cent. which represents the decrease in production. A rough calculation of the value of the three leading grain crops at the New York prices (too high for a valuation of the crops on the farms) makes them:

	1883.	1882.	Decrease.
Wheat.....	\$470,000,000	\$545,000,000	\$75,000,000
Corn.....	962,000,000	1,423,000,000	461,000,000
Oats.....	180,000,000	205,000,000	25,000,000
Total.....	\$1,612,000,000	\$2,173,000,000	\$561,000,000

This decrease in valuation is more than one-fourth.

Its effect on the condition of the producers and the business of the country cannot be anything like this proportion, however. Substantially all the oats produced in the country are consumed here, and when the price is lower the loss to the farmer is the gain of the rest of us. And though a large amount of corn is exported, by far the greater part is consumed not only in this country, but on the farms where it is grown; and a high price for it means chiefly that it costs the farmer more to keep and fatten his hogs and other stock. The lower price of corn is reflected, however, in much lower prices for hogs, and the farmer's surplus, whether sold as corn or in fat hogs and cattle, will bring him much less than at this time last year.

It is true that the high prices of November did not last throughout the whole crop-year; but the prices then governed calculations of the general business of the following months, just as present prices must govern our present calculations. We have a fifth or a fourth less wheat than last year, which sells for a trifle more per bushel (some grades are higher and some lower). We have a little less corn, and because of the larger stock of hogs much less to spare, and it is worth about 25 cents less per bushel (but is not very low in comparison with years previous to last year). The cotton crop is about a seventh less than last year, and the price is nearly the same. At New York prices last year's crop was worth about \$340,000,000, and this year's is worth about \$296,000,000. So large a portion of this crop and of the wheat and provisions is exported that a large difference in price makes a considerable difference in the national income, against which should be set any difference there may be in the prices of the articles we import.

Altogether we cannot see anything in the crops or prices which tends to improve traffic or general business activity. Most of the newspapers continue to talk of the "abundant crops," but crops are not abundant. All of the more important ones (except grass and hay) are below the average, and with a larger acreage we have a smaller production of grain than three and four years ago. There is an "abundance" in the sense that we have sufficient for our needs and a large amount to spare; but, except cotton, we have much less to spare than from the crops of 1878, 1879 and 1880, when our huge surplus made the country rich, and caused the great activity in business which we have sighed for in vain since. Some portions of the country have done extremely well this year, but as a whole the year is below the average in agricultural production.

The Iron Industry.

An over-production of iron and steel seems to be general the world round. The London *Economist* states that the production of pig iron in the three chief producing countries, Great Britain, the United States and Germany, increased from 7,626,466 tons in 1868 to 16,842,365 tons in 1882—121 per cent. in fifteen years. This period, however, includes two separate seasons of great activity in construction, one culminating in 1872 and the other in 1882—construction of railroads, buildings, ships, machinery, and nearly all the appliances used in production. More to the purpose is the increase in recent years. In the United States the production of pig iron increased from 2,301,215 tons in 1878 to 4,623,323 in 1882—100 per cent. in four years. There has been during the same period an enormous increase in European countries, though not nearly at this rate. Of course it was simply impossible that this growth should continue. During the time that this increase of 100 per cent. in pig-iron production had been going on in this country the population had increased 12½ per cent., and to use the whole of it it was necessary that the consumption per inhabitant should be 78 per cent. more in 1882 than in 1878. This was possible only so long as the nation was engaged in greatly increasing its instruments for production, just as the farmer uses many more nails, etc., the year he is fencing new fields and putting up a new barn than he did before, when he simply maintained the old ones, or will afterward, when he is maintaining the new ones. Iron is very largely an element in new constructions, which are made chiefly for the purpose of adding to production of all kinds. But if we were able to go on constructing at the same rate as we have been doing since 1879, it would mean that the production per inhabitant would at least double every ten years, and we certainly have not yet made such progress in the production of wealth—progress that would give every person at the end of this century four times as many goods as he had in 1880. The danger at such times is that appliances for production—buildings, railroads, machinery, etc.—will be increased beyond our ability either to produce or to consume; and this is especially so in some industries, and in the iron industry more so apparently than in

any other, because the iron industry more than any other must furnish the materials for increasing industrial appliances, and into it enters a large proportion of the capital that then becomes "fixed." It is stimulated to extraordinary activity to provide these materials; having provided them, even if none too many have been provided, it has only to maintain them until again there is need of more factories, railroads, etc. This causes the iron industry to undergo exceptionally great fluctuations. It has recently had, as we have seen, a period of tremendous activity and growth; it is now apparently suffering from the inevitable reaction.

In steel the increase in production has been at a greater rate than in pig iron even; but this has been largely because of a revolution which has substituted steel for iron for many purposes. Thus, the fact that the production of steel rails in Great Britain increased from 410,000 tons in 1872 to 1,683,649 in 1882, and since 1882 has been more than 50 per cent. does not argue so great an increase in consumption as it would if one did not know that iron rails have been going out of use and steel rails coming in. In the United States fifteen times as many Bessemer rails were made in 1882 as in 1872, and the increase since 1878 was 160 per cent.; since 1880 51 per cent. Nothing was more certain than that this growth could not continue, especially as there were 11,500 miles of new railroad constructed in 1882, and that in three years the mileage of the country had been increased about one third. The steel production of the world increased from about 2,400,000 tons in 1877 to more than 6,000,000 in 1882—an increase of 150 per cent. in five years. It is said that the Bessemer works of the world now have capacity to renew all the railroad tracks in the world every six years. With an average life of fifteen or twenty years, this, we see, gives a vast yearly surplus. For nine out of the fifteen years the works must be turning out rails for new roads, if they are worked up to their full capacity, which would double the mileage of the world every ten years nearly. Now, it is only in this country that it has been possible to do this, and here, we venture to say, it is possible no longer. An increase of 240 per cent. from 1850 to 1860 was possible; it required the construction of 21,614 miles of railroad—about what we built in 1881 and 1882; the increase of 73 per cent. from 1860 to 1870 involved building 22,279 miles; much greater was the addition of 74 per cent. from 1870 to 1880—39,030 miles. We managed to build 21,385 miles in the first two years of this decade, but it is hardly necessary to say that we cannot keep on at this rate, adding 23 per cent. every two years. That would give us about 255,000 miles of railroad in 1890, and with the probable growth of population would leave us with 263 inhabitants per mile of road, while we have about 475 now.

In most other countries the possibility of growth is nothing like what it is here, and it is quite probable that the German works, for instance, will be longer in finding the demand equal to their capacity than our own. It must be remembered, however, that these European works have the world for their market, and will be profited by any increase in consumption in Canada, Mexico, Australia, India or China. Indeed, should China determine to build railroads (and it very likely will one of these years) there may be use for all the iron that existing works can turn out.

The future of the Bessemer works may be considerably improved by a further substitution of steel for iron, which will be encouraged by the lower prices of steel. No great increase in the demand for steel is anticipated from such a change, however, which has been going on for several years, but except in the case of rails has not been very rapid. Abroad Bessemer steel is little if any cheaper than before 1879, rails having been sold then for about \$20 a ton in Belgium and England. There as well as here great efforts were made to find new applications for steel. Even if successful, however, such efforts do not result in a greater consumption of pig iron. In fact the whole advantage of Bessemer steel consists in its reducing the consumption of iron, by furnishing a more durable material and making the renewals less frequent. About 1870 a great many railroads had to renew their rails on an average once in three years. Now, laid with steel, they do not make one-fourth of their old drafts on the blast-furnaces and iron mines. The vast new construction of the past four years is nearly all steel; the old tracks are mostly renewed with steel; the consumption for maintenance, except in a few years, has always been more than that for new road, and it should be very light for years to come on the 35,000 miles built in the last four years, and on the many thousands of miles of old tracks renewed with steel meanwhile.

The *Bulletin* of the American Iron and Steel Association has collected blast furnace statistics giving the

condition of the business Nov. 1, which indicate that it has held its own very well since June. At that time there were 334 furnaces in blast, against 417 Jan. 1. Nov. 1 there were 331 in blast—an insignificant change. This does not indicate a good condition of the business by any means, because there are 686 furnaces and nearly 52 per cent. of them are out of blast, but it indicates that the production has already been reduced to a level with the consumption, and this is further shown by the fact that while there were 528,590 tons of pig in the hands of the makers or their agents July 1, this stock had been reduced to 432,354 tons Nov. 1.

The chief reduction this year has been in anthracite furnaces, of which 117 were in blast Nov. 1, against 125 July 1, and 161 Jan. 1—a decrease of 27 per cent. in the ten months. As many charcoal furnaces were in blast Nov. 1 as July 1, but nearly a fourth less than Jan. 1 (98 against 129). In bituminous furnaces the decrease has been comparatively small, and there is an increase since July 1, the number in blast having been 127 Jan. 1, 111 July 1, and 116 Nov. 1.

Of the 88 furnaces that have gone out of blast since Jan. 1, 36 are in Pennsylvania, and 59 west of Ohio. There is no decrease in Virginia, West Virginia, or Alabama. In the West the proportion out of blast is about the same as in the East; 90 out of 170.

The *Bulletin* had information that 19 furnaces would blow in, and 15 blow out in November, which will probably not greatly change the production. The blowing-in of so many indicates that there are many furnaces which are able to make some profit under existing circumstances, and there is confidence that the demand will not be much reduced. It is quite probable, however, that the statistics of furnaces blowing in are more complete than those of furnaces blowing out. People usually are more ready to tell that they will resume business than that they will stop.

Recent large sales of steel rails at \$35 per ton seem to have determined the closing of some works and a reduction of works by others. When prices have gone so low that works of this kind prefer closing to producing at such prices, it is pretty good evidence that they will not go lower unless there is a reduction in the cost of production. Should ore and coal and labor, and consequently pig iron, become cheaper, doubtless the works that now can afford to sell at \$35 could sell for less. But unless there is some reduction in the elements of cost, we can hardly expect lower prices for rails.

October Accidents.

Our record of train accidents in October, given in full elsewhere, contains brief accounts of 82 collisions, in which 23 persons were killed and 72 hurt; 85 derailments, in which 19 persons were killed and 154 hurt, and 7 other accidents, in which 1 person was killed and 8 injured. In all there is mention made in the record of 174 accidents in which 43 persons were killed and 224 injured.

This record, it should be remembered, includes only accidents to trains, and makes no mention of the casualties to employes resulting from coupling cars, yard and other similar work; nor does it record the accidents which occur at road crossings, to persons walking on the track and to others not passengers on trains or employes in train service.

As compared with October, 1882, there was an increase of 38 accidents; a decrease of 4 in the number killed and an increase of 102 in the number injured.

These accidents may be classed as to their nature and causes as follows:

COLLISIONS:	
Rear	58
Butting	20
Crossing	4
—82	
DERAILMENTS:	
Broken rail	4
Broken rail-joint	1
Broken bridge	2
Spreading of rails	12
Broken wheel	3
Broken axle	7
Broken truck	3
Land-slide	1
Wind	1
Accidental obstruction	7
Cattle	6
Misplaced switch	7
Open draw	1
Flying switch	1
Rail out for repairs	1
Purposely misplaced switch	2
Rail purposely removed	1
Unexplained obstruction	1
Unexplained	24
—85	
OTHER ACCIDENTS:	
Boiler explosions	3
Broken axle not causing derailment	1
Cars burned while running	3
—7	
Total	174

No less than 15 collisions were caused by trains breaking in two; four by mistakes in orders or failure to obey them; three by misplaced switches; two by runaway engines; two by cars carelessly left on the main track; two by fog; one each by a flying switch, by a wreck on another track and by failure to use signals at the proper time.

Of the two broken bridges, one had been damaged and partly destroyed by fire; for the failure of the other no special cause is assigned.

Ten accidents—three collisions and seven derailments—were due to that too common form of carelessness, the misplaced switch.

One of the cases of spreading of rails was due to the carelessness of trackmen in leaving a rail insecurely fastened. Trackmen were also the cause of another accident, of a kind which is continually recurring, taking up a rail for repairs and neglecting to put out the proper signals.

Spreading of rails, it may be noted, is sometimes given as a cause of accident where it is almost impossible to determine whether it is the real cause or not. After an accident the rails are very likely to be out of place, and sometimes it is very difficult to decide whether their displacement is the result or the cause of the accident.

Four malicious derailments are recorded, two by switches misplaced, one by removing a rail from the track, and one by an obstruction placed on the track.

A general classification of these accidents is made as follows:

	Collisions.	Derailments.	Other.	Total.
Defects of road	15	19	4	38
Defects of equipment	15	15	4	34
Negligence in operating	64	10	7	81
Unforeseen obstructions	3	13	3	19
Maliciously caused	—	4	—	4
Unexplained	—	24	—	24
Total	82	85	7	174

Negligence in operating was thus the chief cause of accidents, 42½ per cent. of all the accidents being traced to it directly, besides others which might be indirectly due to neglect or carelessness.

A division according to classes of trains and accidents may be made as follows:

Accidents:	Collisions.	Derailments.	Other.	Total.
To passenger trains	32	2	—	34
To a pass. and a freight	17	—	—	17
To freight trains	61	53	5	119
Total	82	85	7	174
Casualties:				
Killed by	23	19	1	43
Injured by	72	134	8	214
Total	95	173	9	277

This shows accidents to a total of 256 trains, of which 59, or 23 per cent., were passenger trains, and 197, or 77 per cent., were freight trains.

Of the total number of accidents 100 are reported as having taken place in daylight, and 74 at night. The number of night accidents should increase as the hours of daylight grow shorter.

The persons killed and injured are divided as follows:

	Employes.	Passengers.
	Killed. Injured.	Killed. Injured.
In collisions	15 31	8 41
In derailments	13 54	6 140
In other accidents	1 7	— 1
Total	29 92	14 142

Of the killed 67 per cent. and of the injured 39 per cent. were railroad employes, who thus furnished 44 per cent. of all the casualties. This proportion, however, is easily changed or reversed by one or two accidents in which a considerable number of passengers are hurt.

Deaths were caused by 14 collisions, 15 derailments and 1 other accident; injuries but not death by 20 collisions, 24 derailments and 3 other accidents. In all 30 accidents caused death and 47 lesser injuries, leaving 97, or 56 per cent. of the whole number, in which there was no serious injury to persons.

Very few of the accidents can be attributed to the weather or to climatic or atmospheric causes, the month having been generally not unfavorable to railroading. The number of collisions continues large, as might be expected in a month of heavy traffic and with a considerable mileage of new road opened.

Perhaps the principal point to be noted in the record for the month is the nature of the failures of equipment which were the direct causes of accident. Chief among these were the collisions caused by trains breaking in two, which calls attention with emphasis to the insufficient couplings almost universally in use. The breaking of passenger trains is a very rare occurrence, although their length and the weight of the cars have greatly increased, and this is due to the improved methods of coupling so generally adopted. But on freight trains we find that the old styles are still in use, and that the strength of the coupling gear has not been by any means increased in proportion to the length and weight of trains which have been so much increased within the past few years. That this should be the case may justly be regarded as a reproach to car-builders.

The considerable number of broken axles recorded also brings up the question whether the standard axles are after all heavy enough to carry safely the 20-ton freight car which is now so generally used. This also deserves the careful attention of car-builders.

For the year ending with October the record is as follows:

	Accidents.	Killed.	Injured.
November	125	38	129
December	148	29	209
January	168	55	199
February	184	61	186
March	142	13	137
April	106	26	114
May	120	28	77
June	91	38	95
July	119	57	204
August	144	42	136
September	158	44	183
October	174	43	224
Total	1,679	472	1,903
Total, same months, 1881-82	1,397	401	1,466
" " " 1880-81	1,492	397	1,687
" " " 1879-80	953	280	1,002

The yearly average for the four years was 1,365 accidents, 388 killed, and 1,515 injured. The present year is

thus very much above the average in all respects, having had the largest number of accidents ever included in our records.

The averages per day for the month were 5.51 accidents, 1.39 killed, and 7.55 injured; for the year they were 4.60 accidents, 1.29 killed, and 5.20 injured.

The average casualties per accident were, for the month, 0.247 killed and 1.345 injured; for the year, 0.281 killed and 1.133 injured.

The averages per month for the year were 140 accidents, 39 killed and 159 injured. October was considerably above the average in all respects.

The Summer Packing Season.

During what is known as the "summer" packing season, which includes the eight months from March 1 to November 1, many more hogs were packed this year than last, but not nearly so many as in any other year since 1878. The numbers packed during this season for the last six years have been:

1878.	1879.	1880.	1881.	1882.	1883.
3,378,044	4,051,248	5,323,898	4,803,080	3,210,787	3,770,828

Thus the number packed this year was 560,041 (17½ per cent.) more than last year, but 1,033,000 less than in 1881, and 1,553,000 less than in 1880. It is encouraging, however, to see that progress has been made this year, after two years of so startling a decline; and the increase this year is really large. The stock had so decreased in consequence of the very short corn crop of 1881 that to bring it up to its old proportions will take more than one year. There was also some increase in the winter packing in the last season (November 1 to March 1), and the aggregate number packed in the twelve months ending with October for six years has been:

1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.
9,883,490	11,531,896	12,274,349	11,723,145	8,958,547	9,903,040

Thus the number packed this year is 945,000 (10½ per cent.) more than last year, and nearly the same as in 1877-78, but 1,820,000 less than in 1880-81, and 2,371,000 less than in 1879, which was the great packing year. The reduction since 1880 has had a considerable effect on traffic, as it was more rapid than the growth before 1880.

The summer packing is a comparatively recent growth in anything like its present proportions. In 1876 it was but one-fifth of the whole, but it ran to 34 per cent. in 1878, to 43 per cent. in 1880, and was 35½ and 38 per cent. in the last two years.

The changes in the number packed at the different packing towns is a matter of great interest to the carriers, as the growth of a great packing business anywhere means the growth of an important traffic centre. For four years the numbers packed at the places which pack most have been:

	1879.	1880.	1881.	1882.	1883.
Chicago	2,155,418	2,971,127	2,700,000	1,604,957	1,890,000
Kansas City	145,638	239,720	455,111	308,490	585,000
Archison	171,006	223,447	—	—	—
St. Louis	350,000	410,000	350,000	215,176	235,000
Indianapolis	243,500	383,165	108,000	112,400	190,000
Cedar Rapids	141,085	259,655	290,000	170,289	187,500
Cincinnati	149,034	110,556	145,000	81,916	130,000
Cleveland	319,805	324,440	236,410	150,421	120,000
Milwaukee	67,537	136,619	102,447	112,000	100,000
Ottumwa	—	57,334	76,338	58,571	51,500
Sioux City	—	—	—	37,402	46,820
Keokuk	—	—	—	12,946	27,008
Dubuque	—	—	—	15,000	15,500
Marshalltown	—	—	—	1,461	16,500
Des Moines	40,860	56,526	52,254	22,735	23,000
Omaha	—	—	48,630	60,000	49,000
Nebraska City	—	—	—	10,000	—
St. Joseph	—	18,000	40,000	20,000	17,000
Detroit	61,675	44,217	40,199	35,925	35,000
Louisville	25,000	30,000	30,000	17,581	25,000
Other places	169,590	59,192	99,320	53,521	27,000
Total	4,051,248	5,323,898	4,803,080	3,210,787	3,770,828

No place approaches Chicago as a packing centre. In every year it has packed more than half of the whole number. But Kansas City makes a more rapid growth than any other place. This is the third year it has been second in the list. In 1879 it packed but 3.6 per cent. of the whole number, in 1881 9.5, this year no less than 15½ per cent. of the whole, and more than any two places except Chicago.

The Iowa towns that report together show a considerable business, though no one of them has what can be called a large one for one of the greatest of the corn states. Altogether they packed 367,828, or nearly a tenth of the whole number, this year, against 318,361 last year. The Missouri River towns altogether packed 661,000, this year, but none of them can compare with Kansas City in the extent of its business. Below we summarize the packing in different sections:

	1879.	1880.	1881.	1882.	1883.
Chicago	2,155,418	2,971,127	2,700,000	1,604,957	1,890,000
Elsewhere west of Mississippi	867,511	1,028,997	782,056	510,243	590,000
St. Louis and Iowa towns	541,485	783,415	678,572	533,540	602,828
Mo. River towns	317,244	481,167	543,741	448,526	661,000
Unspecified	169,590	59,192	99,320	53,521	27,000
Total	4,051,248	5,323,898	4,803,080	3,210,787	3,770,828

The proportion of the whole number packed west of the Mississippi has increased slightly, which is chiefly due to the growth of the business at the Missouri River points, and especially at Kansas City, for the business has decreased at St. Louis, which packed 8.6 per cent. of the whole in 1879, but only 6.2 per cent. this year. The total percentage packed west of the Mississippi and that at the Missouri River points in the several years has been:

	1879.	1880.	1881.	1882.	1883.
West of Mississippi	25.4	24.8	27.5	32.2	34.2
Mo. River points	7.8	9.0	11.3	14.6	17.5
St. Louis and Iowa towns	17.6	15.8	16.2	17.6	16.7

Thus the places between the two great rivers seem to have

made no progress, and it is the Missouri River points alone that have gained in rank.

We might expect these places and the Iowa towns to gain most or gain while other places lose, because they are nearest the country where there is most new land suitable for growing corn. But it has so happened that the corn crops were very heavy west of the Missouri last year (and this year) when they were light east of the Missouri, so that there was comparatively a much larger supply of hogs in the country from which the Missouri River points draw their supplies than in that which supplies the other packing towns, including the Iowa towns. The inference that there will be little growth of the business hereafter in the Iowa towns may therefore not be justified; but the indications are that there will hereafter be but two great packing centers, at least for summer packing, namely, Chicago and Kansas City. This year Chicago packed 50 per cent. of the whole number and Kansas City 31 1/4 per cent. of all the rest.

This business is so important to the railroads that its course will be watched with interest. The stock of hogs has been so replenished that we might have had something like the business of 1879, 1880 and 1881 if the corn crop had been a full one. Unfortunately it is far from that. Later reports are more unfavorable than those shortly after the early frosts. In many places where there were no early frosts much of the corn did not mature, and there are complaints of an unsatisfactory crop generally throughout southern Iowa, and as far south as Mattoon, Ill., and Richmond, Ind.

There is in Illinois and Iowa, taken as a whole, more corn than last year, perhaps, and present prices of hogs indicate there is abundance to meet present demands. But it is far from being a heavy crop, nevertheless. If it had been, present prices might have been fairly remunerative.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Bellaire, Zanesville & Cincinnati.—Extended west to Caldwell, O., 2 miles. Gauge 3 ft.

Chicago, St. Paul, Minneapolis & Omaha.—The *Nebraska Division* is extended from Coleridge, Neb., northwest to Hartington, 10 miles. The *Chippewa Falls & Northern Branch* is extended from Rice Lake, Wis., northwest to Chicago Junction, 23 miles.

Des Moines, Osceola & Southern.—Extended from Leon Ia., south to Cainesville, Mo., 24 miles. Gauge, 3 ft.

Fargo Southern.—Track laid from Fargo, Dak., southward to Wild Rice, 10 miles.

Florida Southern.—Extended from Ocala, Fla., to Lake Weir, 18 1/2 miles, and from junction to Micanopy, 3 1/2 miles. Gauge, 3 ft.

Georgia Pacific.—Track laid from Cane Creek Tunnel, Ala., west 5 miles, completing the road between Atlanta, Ga., and Birmingham, Ala. Gauge, 5 ft.

Grand Trunk.—The *Michigan Air Line Division* is extended from South Lyon, Mich., west to Stockbridge, 30 miles.

Louisville, New Orleans & Texas.—Extended from Dogwood Ridge, Miss., southward 23 miles.

Northern Pacific.—The *Palouse Branch* is extended eastward to Culfax, Wash. Ter., 24 miles.

Williamstown.—Extended from Williamstown, N. J., west to Glassboro, 7 miles.

Wisconsin, Iowa & Nebraska.—Extended southwest to Baxter, Ia., 7 miles. Track also laid from Des Moines, Ia., northeast 3 miles.

This is a total of 190 miles of new railroad, making 5,600 miles thus far this year. The total new track reported in our columns to the corresponding date for 12 years past has been as follows:

	Miles.		Miles.
1883.....	5,600	1877.....	1,945
1882.....	9,171	1876.....	2,102
1881.....	9,649	1875.....	1,150
1880.....	5,342	1874.....	1,686
1879.....	3,150	1873.....	3,350
1878.....	1,917	1872.....	6,311

The statements include *main track only*, no account being taken of second tracks or other additional tracks or sidings.

The track thus far reported has been exceeded in three years only—1882, 1881 and 1872. The weather continues favorable for track-laying and there may be more additions to the new mileage yet this year than has been expected.

THE PROHIBITION OF TICKET SALES by the trunk lines over certain railroads west of Chicago has provoked angry comment in some newspapers, apparently inspired by agents of some of the companies put under the ban, but the communications received concerning the matter at the office of the Joint Executive Committee have been chiefly requests for explanations and not protests, we understand. It may seem to be a matter of no concern to the railroads from New York to Chicago what the railroads west of Chicago do with regard to cutting rates, paying commissions, etc., on their own roads. But in fact these Western roads in New York and elsewhere in the East sell the tickets of the Eastern roads in connection with those of their own roads, and by the heavy commissions they pay on their own tickets they change the division of traffic among the Eastern roads which the latter have agreed upon with each other. A scalper in New York who has a customer wanting a Chicago ticket buys a ticket of the agent of a Chicago road from New York to Kansas City or Omaha by way of Chicago. He receives a commission of perhaps six or seven dollars, all of which comes from the Chicago company.

This enables him to sell the passenger a ticket to Chicago for less than the regular rate (though the railroads receive the full rate) and leaves him with a ticket from Chicago to the western point which he can also sell at a profit for less than the regular rate. Now the result of this is that a New York-Chicago trip, which is business included in the pool of the Eastern roads, and the earnings from which they divide in agreed proportions, is converted ostensibly into a New York-Kansas City or New York-Omaha trip, which is not pool business. The roads paying the large commissions do not connect with all the Eastern roads, but with part of them only. Their operations therefore take from the roads with which they do not connect earnings which they are entitled to. Taken as a whole the lines east of Chicago are benefited by the operation, and the lines east of St. Louis suffer from it, but it probably works against some of the roads east of Chicago also. Not that the roads west of St. Louis have refrained from paying commissions; but they have not the same margin in an \$8.50 rate that the Chicago roads have in a \$14.80 rate, and their operations have not injured their eastern connections. It is this injury that the Joint Executive Committee roads object to. They do not want to be hurt themselves by the policy of the Western roads, whether it makes these roads rich or poor. It is true, nevertheless, that if this effort of the Eastern roads should result in a restoration of rates (or an abolition of the enormous commissions) by the Western roads, the latter, who are now supposed to protest against the action of the former, would gain very much more than the Eastern roads by it.

THE CHICAGO & IOWA RAILROAD, a controlling interest in which was secured by the Chicago, Burlington & Quincy about a year and a half ago, seems not yet to have become a profitable property. The gross earnings of its line of 104 miles, which passes through a magnificent farming country, but has no large towns in it, except Aurora and Rockford, are reported to the Illinois Railroad Commission for the year ending with June last as \$535,049, or \$5,145 per mile, which is not a very small rate, to be sure; but as the working expenses were \$392,701 (73.4 per cent), the net earnings were only \$142,348, or \$1,369 per mile, and positively light for a company whose fixed charges are \$1,654 per mile. All the bonds of this company bear 8 per cent. interest. At the rate of interest for which the Burlington can now easily get money, the fixed charges would not be more than \$110,000, instead of \$172,000, and the net earnings would much more than cover them. But none of the bonds mature before 1895.

It is over this line that the through traffic of the Iowa lines of the Illinois Central and of eighty miles of its Illinois lines east of Dubuque passes to and from Chicago, and as the outlet of this 482 miles, and of a short branch of the Chicago, Burlington & Quincy, the road has a considerable through traffic. The Illinois Central freight is carried at a very low rate, however.

The earnings for this year ending with June are not very different from those of recent calendar years.

Gross and net earnings and expenses for the last four calendar years, and for this year ending with June last, have been:

	1879.	1880.	1881.	1882.	Year to June 30, 1883.
Gross earnings.....	\$524,373	\$567,835	\$563,055	\$525,071	\$535,049
Expenses.....	328,462	219,452	319,241	436,702	392,701
Net earnings.....	\$195,911	\$348,383	\$243,814	\$83,369	\$142,348

It seems from this that the road earned more than enough to pay interest in the first three years named. The immense increase of expenses after 1881 was doubtless due to very large renewals which were charged to expenses. These were pretty well completed last year, however, and it should cost much less to work the road now. Attention was called to this road about two years ago by the Chicago, Burlington & Quincy's paying \$130,000 for 1,000 shares of stock which the town of Aurora had subscribed and paid its bonds for when the road was built, and which was claimed to be the only valid stock of the company. Some may have thought that this price represented the ability of the road to earn dividends, but as it seems that it has not earned the whole of the interest on its debt since this purchase, it cannot have been directly profitable to the purchaser, which gets a haul of only 39 miles on the traffic contributed by it.

UNION PACIFIC EARNINGS AND EXPENSES IN SEPTEMBER

	1883.	1882.	Inc. or Dec.	P. c.
Gross earnings.....	\$2,994,076	\$3,170,315	—	\$176,239 5.6
Expenses.....	1,535,188	1,260,592	+	274,596 21.8
Net earnings.....	\$1,458,888	\$1,909,723	—	\$450,835 23.6

The decrease in earnings is not very great, though as there is more road worked this year than last, the decrease in earnings per mile is larger in proportion. The increase in working expenses is very great, however. But as the working expenses were at the very low rate of 39 1/4 per cent. of the earnings last year, and in spite of the simultaneous decrease in earnings and great increase in expenses were but 51 1/4 per cent. this year, it is probable that the increase is due to abnormally small expenditures last year rather than to abnormally large ones this year. An explanation of the decrease in earnings this year is that it is primarily due to the opening of the Chicago, Burlington & Quincy to Denver, and also to the falling off in Colorado business. The falling off in Colorado business certainly has been great, but the competition of the Burlington road should not have changed matters greatly, for its Denver extension had been open several months by September last year. It is somewhat

notable that the Chicago, Burlington & Quincy should have had much the largest gross and net earnings in its history in this month of September when the Union Pacific has a decided decrease. The Burlington's Nebraska lines are supposed to be a main cause of its recent prosperity, and the Union Pacific next to the Burlington has most of the Nebraska mileage. Further, the Union Pacific has a vast mileage in Kansas, where traffic must be about as good as in Nebraska, the benefit of which the Burlington gets only as one outlet to it to Chicago. The indications being that the Nebraska and Kansas business is exceptionally good, to account for the Union Pacific's decrease we are left to infer that the traffic of the Far West and the through Pacific traffic is exceptionally poor. So far as the Pacific passenger traffic is concerned, it has been in a sadly demoralized condition for several months, but we had supposed that it was somewhat mended in September. The extension of the Northern Pacific is likely to have greatly reduced the traffic on the Utah & Northern to Montana, but it had no effect on through traffic in September.

THE ISSUE OF NORTHERN PACIFIC SECOND-MORTGAGE BONDS was authorized at the special meeting of preferred stockholders last Thursday by a vote of 352,428 shares to 63, about 6,600 shares not voting. The fact that a stockholder had sought to enjoin the issue of the bonds may have led some to suppose that there was serious question as to the advisability of the issue. But it is not easy to see how there could be. The company already owes a large part of the money which it seeks to obtain by this issue, and its road is not complete. It must finish its road in order to make the profits which can be had from the traffic offering. Whether the cost might not have been, smaller or should not have been anticipated when the first mortgage was issued is not a practical question. The company must owe the money in some shape. As a floating debt it would certainly be very dangerous and cost more for interest than if funded. It must stand between the stockholders and their dividends in any event. The only question with them is to make the burden as light as possible.

It is true that it is a serious matter for the stockholders. The addition to the cost is not to any considerable extent because of an addition of money-earning appliances, but simply because of an under-estimate of cost. It was believed a year ago that the road could be completed without any other debt than the first mortgage bonds then provided for. The \$20,000,000 of second mortgage bonds now authorized will only provide for the same profit-earning instrument that was then expected without them. This means that the stock is actually worth \$20,000,000 less than was then expected (provided the whole amount shall be issued). But for this unexpected requirement, the shares would have had \$1,200,000 per year more than will be available from them now. This is a fact not always appreciated. People often think that what makes a property cost more must make it worth more. The Northern Pacific cannot earn a dollar more with a road from St. Paul to Portland, costing \$100,000,000, than with one of equal capacity costing \$50,000,000. If a line must cross the mountains through a tunnel costing three millions, it will earn no more than if it found its way through a valley at a cost of \$50,000. Unexpected difficulties of construction which add greatly to cost do not in any way affect earnings.

Practically, the public estimation of the value of the Northern Pacific stocks has been in accordance with this view. By present prices they are worth about \$22,500,000 less than the prices a year ago. All other stocks being lower some depression in Northern Pacific would be natural if there had not been the unexpected increase in cost.

IRON ORE PRODUCTION, of course, sympathizes with the iron industry, and the Lake Superior production more especially with the Bessemer industry, as it is a favorite ore for making Bessemer pig. The *Marquette Mining Journal* finds the outlook unfavorable for the Lake Superior mines. It says that enough are developed to supply more than 3,000,000 tons yearly, while the shipments this year will not exceed 2,300,000 tons, though sales were made at prices which left but a small profit to the producer, notwithstanding which the work of opening new mines has continued; it also foresees competition by the opening of new fields and from ores now not available for Bessemer steel, but which will be when the basic process is introduced. The *Bulletin of the American Iron and Steel Association* says little is to be feared from the latter, as the works now established can so fully supply the demand and sell for so low prices that the basic process is not likely to be introduced at more than one or two establishments for many years to come.

It is possible that the narrow margin of profit complained of has reference to the recent valuations of the mines. It is quite probable that the mines will make but a very low rate of interest on the prices paid or valuations made about 1880, when extraordinary prices were paid for ore; but they may still leave a considerable margin of profit over the cost of getting out and marketing the ore. It is not at all necessary to the prosperity of the iron industry that land containing iron ore should be dear, any more than it is necessary to the prosperity of the grain trade that land should be dear. It is true that when iron-making is very profitable ore is usually dear and the price of mines high; but this is because there is a limited number of mines, and it is to the activity in the iron manufacturing that makes ore dear, and not dear ore that makes activity in iron manufacturing.

CHICAGO THROUGH RAIL SHIPMENTS EASTWARD for the week ending Nov. 14 for four successive years, have been as follows by the complete report:

Tons	1880.	1881.	1882.	1883.
	53,269	51,949	44,721	48,390

Thus this year the shipments were 8 per cent. more than last, but less than in the other two years.

The percentage of the shipments carried by each road this year and last was:

	1882.	1883.		1882.	1883.
Chi. & Grand T.	17.3	11.9	Fort Wayne	16.9	19.5
Mich. Cen.	25.3	17.9	C. St. L. & Pitts.	14.8	13.8
Lake Shore	18.1	11.2	Balt. & Ohio	7.6	5.2
Nickel Plate	6.8		Chic. & Atlantic	13.7	

The three Vanderbilt roads together had this year 35.9 per cent. of the whole, their share in the pool being 43%. The Michigan Central, which for some weeks had taken much more than its share, took much less in this week. The Lake Shore, which before was far behind its proportion, falls still further behind. The Chicago, St. Louis & Pittsburgh has much more than its share; the Chicago & Atlantic considerably more.

For seven successive weeks the Chicago shipments have been:

Week ending	Oct. 14.	Oct. 21.	Oct. 28.	Nov. 4.	Nov. 11.	Nov. 18.	Nov. 25.
	39,070	43,723	44,326	43,721	44,083	48,760	48,390

Thus the shipments of the second week of November were a little less than those of the first week, and not more, as the Chicago telegrams would indicate. The shipments of both weeks were fairly large, however. Average shipments per day were 6,940 tons in these weeks this year, against a daily average for the whole month of 7,143 last year, 7,217 in 1881, 7,328 in 1880, and 5,669 in 1879. Shipments last year were much larger in the last half than in the first half of the month; but they have not been so in other years, and the advance of rates on the 26th will tend to reduce shipments in the last week of this month.

NEW YORK SHIPMENTS WESTWARD have been very even since July, varying comparatively little from week to week and from month to month, and being very nearly the same as in the corresponding months of last year, when they were considerably larger than in any previous year except 1881, when shipments were made abnormally large by extremely low rates. As the Lackawanna has this year for the first time competed for these shipments and has obtained a considerable part of them, of course there has not been so much as last year for the old roads to carry. In October the total shipments may have been slightly less than last year and not quite so great as in September; but the difference cannot have been considerable. So far as these trunk-line shipments go, they indicate a decidedly heavy trade. It is possible, however, that the shipments by the circuitous routes—New London and Richmond—and those by canal have fallen off, though as the trunk-line rates are higher this year than last we should not expect it. The fact that the Lackawanna has been carrying at less than trunk line rates may, however, have reduced the shipments by these other cheaper routes. It is second-class freight chiefly that goes by these routes and by the Lackawanna also. Shipments in August, September and October are usually the largest of the year, and in every year that has been recorded, except 1879, there was a falling off from October to November. This falling off was very large last year because rates were advanced Nov. 1, but shipments were up to the usual winter average taking the season as a whole.

LAKE RATES have not advanced with the near approach of the closing of navigation, but have fallen rather. The stormy weather of last week interrupted shipments, and some of the sailing vessels have been laid up this week. Clearances have been very few, and nearly all propellers, at least from upper lake ports. From Detroit and Toledo clearances can be made safely later, as the vessels do not have to pass through the straits. Late quotations from Chicago are 3½ cents per bushel for corn to Buffalo.

Canal shipments have been but trifling for a week past. Official announcement is made that the canal will be closed Dec. 1, if not sooner closed by ice, and this does not give time enough to boats to get through to the Hudson. There were small shipments Wednesday, however, at 4½ and 5 cents a bushel for wheat from Buffalo to New York. Shipments to interior points, such as Rochester and Syracuse, can be made later, but by far the larger part of the shipments from Buffalo have been made by rail for some time—last Monday 246,500 bushels by rail against 32,500 by canal. There is over 2,000,000 of grain in store in Buffalo, which will now have to be forwarded by rail or be held till spring. This, however, is a trifle compared with the stocks in the West, and especially at Chicago.

Ocean freights have not fluctuated much for some time. Recent quotations are 4½d. for grain by steam from New York to Liverpool.

THE CORN MOVEMENT became exceptionally heavy at this time last year because the crop of 1881 was nearly exhausted, and there was a very short supply in all markets, so that new corn had to be forwarded as fast as it was fit to ship. This year the supply at the markets is much greater than last year, but nevertheless it is small, as may be seen by the following statement of the amount in store Nov. 10 at Eastern and Western markets for four successive years:

	1880.	1881.	1882.	1883.
	16,492,430	24,372,782	4,067,168	9,634,395

The amount this year, though 5,567,000 bushels more than last year, is 14,738,000 less than in 1881 and 6,858,000

less than in 1880. The shortness of the supply last year is seen more clearly by the amount on hand at Eastern markets. Altogether there was less than half a million bushels in store east of Buffalo, which was about one day's average receipts in some seasons. This year there is over 5,800,000 bushels east of Buffalo. This obviates the necessity of large shipments very early. Usually very little new corn goes to Eastern markets before January, but last year a great deal came in December.

NEW YORK, PENNSYLVANIA & OHIO EARNINGS for the first three months of the lease were \$1,775,136 this year against \$1,395,152 in the corresponding three months of last year, the increase being \$379,984, or 27 per cent. The effect of the opening of the Chicago & Atlantic is seen in the fact that the gain was \$93,602 in May, \$132,364 in June, and \$151,018 in July. The road's earnings were not small in these months last year, but, on the contrary, were larger than in any previous year. The publication of these earnings enables us to ascertain the Erie's gross earnings on the part of the system which it worked last year, which were as follows:

	May.	June.	July.	Three months.
1883.....	\$1,699,222	\$1,653,991	\$1,694,694	\$5,047,911
1882.....	1,681,798	1,756,084	1,850,290	5,288,742
1881.....	1,776,890	1,794,982	1,787,080	5,358,952

They were thus smaller this year than in either of the two previous, but they were larger than in any year before 1881.

This does not give any indication as to where the great gains of net earnings in August came from. Last year the Erie earned gross \$1,843,144, and the New York, Pennsylvania & Ohio \$528,430 in August, and their aggregate net earnings were \$971,843, against \$1,100,065, plus 32 per cent. of the gross earnings of the New York, Pennsylvania & Ohio this year.

THE DELAWARE, LACKAWANNA & WESTERN has become a member of the trunk line association, and will hereafter conduct its through business in accordance with its regulations and receive a share of the business to be fixed by mutual agreement or by arbitration. The company, we believe, has always contemplated this step, but it has argued that it could not well take it until it had ascertained by trial how much of the traffic it would be able to command. It has for several months taken a considerable part of the New York shipments, but they have been mostly low-class freights, yielding small earnings and profits, and it is generally believed that they were taken at a considerable reduction from the regular rates. The result probably has been that it has affected the business of the lines out of the pool—the Chesapeake & Ohio and the New London route—more than that of the roads in the pool. At least, these outside lines, which by agreement make rates a certain amount lower than those of the short lines, have made further reductions from the pool rates, which they say was necessary to meet the competition of the Lackawanna.

The accession of this road will make the work of maintaining rates west as well as east of Buffalo easier—or rather less difficult, for the word "easy" cannot properly be used in connection with this work.

THE NEW STANDARD TIME seems to have been generally adopted last Sunday, without shocking any one, and, in most places, without any one's being aware of the change except the people who change the clocks. Several railroads will not make the change until next Monday. The Common Council of Chicago has, this week, authorized the change. In Bangor, Me., when the change to 75th meridian time required the clocks to be put back 25 minutes, the Mayor vetoed an ordinance providing for the change, and his veto was sustained. Bangor, however, will probably have to go by United States time after a while, and if it does not it matters little to the rest of the world. It will have to travel by 75th meridian time whether it eats and sleeps by it or not.

THE SCRAP HEAP.

Laying a Water Pipe in a River Bed.

The longest water-supply pipe ever laid on the bed of any river in this country was sunk in the East River yesterday. It was 2,200 ft. in length, reaching from 138th street diagonally across the government channel to North Brother Island. To properly incase the pipe and get it into position has been an engineering feat of some magnitude. More than three months have been required for the work. The casing is built of planks 2½ in. thick. The pipe is threaded at the joints with an iron sleeve 1½ in. thick, each one calked solid with 50 pounds of lead. The wooden box is filled with cement, and welded together with 31,000 pounds of iron bolts. It extended back to the Southern Boulevard, making necessary a deep excavation beneath the tracks of the Port Chester Railroad. The weight is about 350 tons.

The method of dragging the huge box into the water was attended with great difficulties. Two steam tugs and a dredge with a powerful engine failed to start it on its rollers. Strong hawsers snapped under the strain like grocers' twine. Two more tugs were sent for, and the long case began to glide down the street into the stream as smoothly as the cable on the Brooklyn Bridge. The swift current in mid-river bent it like cork. The friction of the chain on the dredge nearly severed a 10 in. post covered with iron ½ in. thick, and set fire to the dock. The new hospital for contagious diseases on North Brother Island will be able to get Croton water at the rate of 1,000,000 gallons a day under ordinary pressure. John McQuade & Co. contracted to do the work for \$32,000.—*New York Times*, Nov. 21.

24 O'clock.

One railroad at least has adopted the system of numbering the hours from 1 to 24, abandoning the old distinctions of "a. m." and "p. m.," and one newspaper intends to try it also. The *Detroit Evening Journal* of Nov. 17 says:

"Readers of the *Evening Journal* will doubtless be sur-

prised to find that the first edition of this paper to day is dated 14 o'clock. Having decided to illustrate sidereal time, or the new 24 o'clock idea, the *Evening Journal* appears to-day just as it would were that system in vogue in its entirety. The idea is carried out through every department of the paper, and our railway time tables will show that many trains depart at 19:50 o'clock and others arrive at 21:15 o'clock; so, too, the curtain rises at the theatre at 20 o'clock and church services begin at 19:30. To-day's editions of the *Evening Journal* are '14 o'clock,' '15 o'clock' and '17 o'clock' respectively. This need cause no confusion to the reader, who has to remember that there is no a. m. and p. m., and whenever any time is given beyond the noon hour the reader has but to subtract 12 to get the proper hour as our clocks now read. The *Evening Journal* has put itself to no little trouble and expense in order to give the 24 o'clock idea a practical illustration, and we hope it will at least prove a novelty if nothing more."

Casualties on Massachusetts Railroads.

From the returns of eight of the principal railroads of the State for the year ending Sept. 30, 1883, some interesting figures are taken regarding the number of people killed or injured on the several roads. The returns are those of the Boston & Albany; Boston & Lowell; Boston & Maine; Boston & Providence; Eastern; New York & New England; New York, New Haven & Hartford, and the Old Colony. The Fitchburg's figures were not obtainable. The figures show an increase in the number both of killed and injured, over the previous year, there being 221 reported killed this year against 216 the year before, and 535 injured against 483 the previous year. The following table will show the facts obtained from the returns:

ROADS.	Passen- gers.		Em- ployés.		All others.		Total, 1883.		Total, 1882.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Boston & Albany.....	0	6	13	147	18	48	31	198	33	104
Boston & Lowell.....	1	1	7	6	9	2	17	6	16	9
Boston & Maine.....	3	1	4	5	6	8	13	14	16	7
Boston & Providence.....	0	1	2	0	5	5	7	6	9	11
Eastern.....	7	3	6	10	15	19	28	23	27	72
New York & New England.....	0	27	31	100	21	25	52	152	37	94
New York, New Haven & Hartford.....	4	11	11	75	35	27	50	113	52	104
Old Colony.....	1	2	0	10	16	8	23	20	26	18
Totals.....	16	52	80	353	125	133	221	535	216	483

The large number of accidents to the employés is a sad commentary upon the carelessness of that class of men. A few days since the writer was in a freight yard where an engine was engaged in shifting cars. A young fellow caught up a link and pin, jumped in front of a rapidly moving car, and, running ahead of it, managed to put the link in place. If he had slipped, nothing could have saved him from instant death. The General Manager of the road chanced to be passing at the time, and the reckless man received a warning he will be apt to remember. The incident serves to show how careless men accustomed to danger become, and indicates, in some degree, how it is that so many railroad employés are killed or injured. Another thing to be considered in this connection is the fact that two or three of the companies have had construction gangs at work along the line of their roads this year, and it is a fact well known to railroad men that the Italians, who, on the New York & New England at least, largely constitute these gangs, are the most heedless set of men that can be found; in fact, they seem to have no idea of the danger of getting in front of a moving train, and it is believed, many of the accidents reported are to men of this class. The following table presents some interesting figures regarding the average number of employés on the several roads, and, as near as can be figured, the liability of an accident happening to one of the employés:

	Miles operated.	Average No. of em- ployés.	Casual- ties. One in about
Boston & Albany.....	369	5,233	33
N. Y. N. H. & Hartford.....	203	3,994	46
N. Y. & New England.....	385	4,000	31
Old Colony.....	408	2,751	172
Eastern.....	200	2,509	161
Boston & Maine.....	200	2,093	233
Boston & Lowell.....	140	1,615	124
Boston & Providence.....	68	871	436
Totals.....	2,116	23,116	154½

*Estimated.

It will be seen that the New York & New England road, although frequently denounced as one of the poorest managed in the country, makes an excellent showing by the side of the Boston & Albany, which is universally regarded as a model road in every respect. The New York & New England is very largely a single-track road, while the Boston & Albany is almost wholly double track. Regarding the comparative danger to employés on single and double track roads, the Railroad Commissioners last year, in noting the increase of accidents to employés, said: "The great increase of all these numbers is largely due to the great increase both in freight and passenger traffic; but a truer form of statement, in many cases, would be that the insufficiency of a single track for any large business has made this increase a source of peril." Last year the Boston & Albany was credited with operating 369 miles of track and owning 704 miles, if measured as single track, while the New York & New England operated 385 miles, and owned 451 miles if measured as single track. The construction of new track this year has not materially altered the relative mileage. It will be seen that one man out of 31 of the New York & New England employés was killed or injured, while one out of 33 of the Boston & Albany, and one out of 46 of the New York, New Haven & Hartford employés suffered. The Boston & Providence road makes the best showing, and the Boston & Maine comes next. But, as the Commissioners said last year: "The alarming number of injuries, fatal and otherwise, calls for new vigilance in the use of safety appliances, and in the employment of fit persons."—*Boston Herald*.

Attempt at Train Wrecking.

Last night at Union station, between Newark and Columbus, O., a heavy stone was chained to the Pan Handle track, with a view apparently to wreck the fast east-bound mail which left this city on Friday. Fortunately a freight preceded the mail, and having slowed up to water, discovered the obstruction in time to avoid a wreck. Trainmen recall a wreck which occurred at this spot about a year ago, which was then attributed to a broken rail, but which is now supposed to have resulted from the premeditated villainy of scoundrels.—*Indianapolis News*, Nov. 16.

Over Production of Iron in this Country.

The Bulletin of the American Iron & Steel Association, of Nov. 14, says:

"Is there any remedy for the evils of over production? Without concerning ourselves at present with the future of the iron and steel industries of other countries, we may say that here at home, with only our own market to rely upon, the sole remedy is to make less iron and steel than we have been making. This remedy is now being applied; it has, in fact, been very vigorously applied for some time. Ever since last spring we have been engaged in blowing out furnaces and in putting many rolling mills on a single turn. The rail mills, or at least a majority of them, have for a much longer time wisely refused to overstock the market with their products. The steel rail interest must now pursue a similar policy of restricting production. Only the mills that can make rails at \$35 can afford to run regularly; the others must stop or run spasmodically until the demand increases. In a little while—possibly much sooner than is now anticipated—the production of all leading iron and steel products will be no greater than the demand, and when this point is reached prices will at once recover. Even another boom in the early months of 1884 is not improbable. One thing is certain: the iron and steel manufacturers of this country, having learned a lesson during the recent hard times, will not again run their furnaces, and rolling mills, and steel-rail works without profit or at a dead loss. The railroad companies and other consumers who are now engaged in forcing down prices may find before many months have passed that they are exhibiting no more wisdom now than they showed in withholding orders just before they were caught by the boom of 1879. If our recollection is not at fault, they then paid dearly for their indulgence in a short-sighted and really ungenerous policy."

Stolen Railroad Tickets.

A dispatch from Chicago, Nov. 19, says: "Five years ago a considerable number of Chicago & Alton unlimited tickets from Chicago to Galveston, via New Orleans, worth \$60 each, were stolen from the down-town office of the company in this city. Shortly afterward, William Brice, the ticket agent, disappeared and has not been heard of since. Several of the stolen tickets have been passed upon the company. To-day the remainder were found in a scalper's office, in the hands of A. D. Meehan, who was arrested. He told a story of their wanderings through a number of hands after having been left as collateral by Brice. It is not probable that any one can be convicted."

Pig Iron Prospects.

The Secretary of the American Iron and Steel Association has prepared a detailed exhibit of all the blast furnaces in the country on Nov. 1, and of the stocks of pig-iron on hand and unsold at the same time. The exhibit says: "We commenced the present year with 417 furnaces in blast and 270 out of blast. By June 1 we had reduced the number in blast to 351, and a month later we had still further reduced the number in blast to 334. This was a very great shrinkage, and as a result of it we said in July, and have since repeatedly said, that there could be no overproduction of pig-iron so long as there should be no increase of furnaces in blast. We are now gratified in being able to state that on Nov. 1 the situation as it existed on July 1 has been maintained. The number of furnaces in blast on Nov. 1 was 331."

"The facts in regard to stocks are still more favorable. On Jan. 1 there were 353,655 gross tons of pig iron in the hands of makers and their agents. By July 1 the quantity of pig iron thus held had increased to 528,590 gross tons. This increase of 144,935 tons had been accomplished while 83 furnaces were being blown out, or these furnaces were blown out because it was shown that stocks were increasing. We can now say that since these 83 furnaces have been blown out the tendency to an increase of stocks has not only been checked, but that a very great decrease in the quantity unsold on July 1 has also been effected. On Nov. 1 this decrease amounted to 96,236 gross tons, leaving 232,354 tons unsold, against 528,590 tons on July 1."

"On Nov. 1 there were no stocks worth mentioning in the hands of speculators, nor were there at any of our ports any noteworthy stocks of foreign pig iron. Of hypothecated stocks at that date we can hear of none worthy of notice, except the Marshall pig iron at Pittsburgh. This we have not included in our statistics of unsold stocks in July or November. Taken altogether, our statistics of furnaces in blast and stocks unsold on Nov. 1 are favorable to the pig-iron makers, especially when it is considered that stocks in the hands of consumers are notoriously low, owing to the prevalence for several months of the 'hand-to-mouth' policy."

A Mexican Train Robbery.

A dispatch from Laredo, Tex., Nov. 14, says: "A bold train robbery was perpetrated at 7 o'clock last night on the Mexican National Railroad, 20 miles south of here, across the Mexican line. As the train from Saltillo, Mexico, bound for this place, rounded a curve on a lonely spot, not far from La Jarita, a small station, the engineer discovered that a rail had been removed from the track. He applied the brakes and reversed his engine as soon as possible, but too late to save the train, which was thrown from the track. The engine and the first two cars were wrecked, and others were somewhat damaged. The fireman was killed, falling beneath. The engineer was considerably bruised. Simultaneously, as the train left the track, about 40 masked men issued from adjoining woods and made an attack. They compelled the conductor to give up the money in the express car, \$6,000 in silver, and were about to relieve the passengers of their valuables, when it became known that one of the passengers had escaped and gone to La Jarita for assistance. The robbers thereupon took flight, returned to their horses and retreated into the woods. It is thought they have crossed the Rio Grande, and are now upon American soil. Scouting parties are out in all directions searching for them, and the entire country in the vicinity is aroused. Several of the robbers spoke good English. The leader forced the conductor to deliver his treasure under the oath that he would kill all the Americans on the train. The robbery was skillfully planned, but with reckless disregard for human life. None of the passengers were seriously hurt by the derailling of the train. The rail was entirely removed from the track, and the telegraph wires cut so as to destroy communication between stations. The name of the dead fireman was not learned."

General Railroad News

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:
Baltimore & Ohio, adjourned annual meeting, at Camden Station in Baltimore, at 10 a. m. on Nov. 26.
Lehigh & Hudson River, annual meeting, at the office in Warwick, N. Y., Dec. 3, at noon.
Worcester, Nashua & Rochester, meeting to organize the

company as consolidated, at Horticultural Hall in Worcester, Mass., at 11:30 a. m. on Dec. 1.

Dividends.

Dividends have been declared as follows:
Boston & Albany, 3 per cent., quarterly, payable Dec. 31, to stockholders of record Nov. 30.
Boston, Concord & Montreal, 3 per cent., semi-annual, on the preferred stock, payable Nov. 28, to stockholders of record Nov. 13.
Chicago & Eastern Illinois, 7 per cent. on the income bonds, payable Dec. 17.
Georgia (leased to Central, of Georgia, and Louisville & Nashville), 2½ per cent., quarterly, payable Jan. 15.
Iowa Falls & Sioux City (leased to Illinois Central), 1½ per cent., quarterly, payable Dec. 1.
Northern (New Hampshire), 3 per cent., semi-annual, payable Dec. 1.
Virginia (Midland), 6 per cent., yearly, on the income bonds, payable one-half Jan. 1 and one-half July 1 next.
Wilmington, Columbia & Augusta, 3 per cent., semi-annual, payable Jan. 10.
Wilmington & Weldon, 4 per cent., semi-annual, payable Jan. 16. The July dividend was 3 per cent.

Railroad and Technical Conventions.

The Railway Car Accountants' Association will hold its next annual meeting in St. Louis on the third Tuesday in May, 1884.

ELECTIONS AND APPOINTMENTS.

Augusta, Elberton & Chicago.—At the annual meeting, Nov. 14, the following directors were chosen: J. H. Alexander, W. N. Mercer, M. A. Stovall, James P. Verdery, P. Walsh, Augusta, Ga.; A. S. Buford, W. A. Gunby, Columbia County, Ga.; D. F. Bentley, Walker Hawes, H. J. Lang, Lincoln County, Ga.; T. B. Green, Wilkes County, Ga.; George C. Grogan, Elberton, Ga. The board elected James P. Verdery, President; H. J. Lang, Vice-President; H. P. Moore, Secretary and Treasurer.

Boston & Providence.—At the annual meeting in Boston, Nov. 21, the following directors were chosen: Joseph W. Balch, Thomas P. I. Goddard, Wm. R. Robeson, Royal C. Taft, J. Huntington Walcott, Francis M. Weld, Henry G. Whitney. The board re-elected Henry A. Whitney President; B. B. Folsom, Treasurer.

Boston, Revere Beach & Lynn.—At the annual meeting in Boston, Nov. 15, the following directors were chosen: Matthew Bolles, Amos F. Breed, I. P. T. Edmonds, L. S. Judd, J. W. Smith, David H. Sweetser, Jesse Tirrell, Edward Tyler, Edwin Walden.

Buffalo, New York & Philadelphia.—Mr. D. D. Randall has been appointed Train-Master of the Rochester Division in place of S. W. Haight, resigned.

Chest Creek.—Mr. John Patton, of Curwensburg, Clearfield County, Pa., is President of this new company.

Chicago & Western Indiana.—Mr. Franklin H. Story has been chosen a director in place of D. J. Mackey, resigned.

Detroit, Grand Haven & Milwaukee.—The statement that Mr. S. R. Callaway had been appointed General Manager of this road as well as of the Chicago & Grand Trunk is contradicted by authority.

Eastern Junction, Broad Sound Pier & Point Shirley.—At the annual meeting in Boston, Nov. 20, the following directors were chosen: Alpheus P. Blake, Wm. C. Craig, Horace Farrington, Lyman S. Hapgood, F. H. Henshaw, Thomas A. Henshaw, David Loring, A. D. McClellan, Joseph E. Merrill, Charles J. Page, Herbert T. Whitman.

Eureka Springs.—Messrs. Charles H. Smith and James O. Churchill, of St. Louis, have been chosen directors in place of J. B. Porterfield, resigned, and James Torrains, deceased.

Indiana Coal.—The directors of this new company are: A. H. Ransom, Covington, Ky.; T. S. Bell, T. B. Currey, A. M. Gazlay, Jr., W. H. Irwin, Wm. Keenecke, G. P. Theobald, Louisville, Kentucky.

Memphis & Charleston.—At the annual meeting in Huntsville, Ala., Nov. 20, the following directors were chosen: Calvin S. Brice, George F. Baker, Jere Baxter, Frederick A. Brown, Napoleon Hill, E. H. R. Lyman, O. A. Lochrane, John F. Martin, George I. Seney, Samuel Shethar, Samuel Thomas, Addison White, A. Woodruff. The road is leased to the East Tennessee, Virginia & Georgia.

Mexican Central.—Mr. Charles T. M. Cotter has been appointed Train-Master of the Tampico Division. He was formerly on the Boston, Revere Beach & Lynn.

Missouri Pacific.—Mr. Warder Cumming has been appointed Superintendent of the Texas & Pacific Division in place of Major J. M. Eddy, resigned. Mr. Cumming has been connected with the Missouri Pacific for many years.

Mr. A. M. Hager, late Assistant Superintendent, is appointed Superintendent of the Missouri Pacific Division in place of Mr. Warder Cumming, transferred.

Mobile & Ohio.—At their annual meeting in New York, Nov. 21, the debenture-holders nominated the following directors for election by the trustees who hold all the stock: August Belmont, Jr., D. P. Bestor, Cornelius H. Clark, Wm. Butler Duncan, James H. Fay, Henry Hall, Jacob Hayes, W. H. Hays, Adrian Iselin, Jr., G. Jordan, J. P. McMahon, E. L. Russell, Moses Waring.

Monadnock.—This company, whose road is leased to the Chesire Co., has elected H. R. French President; J. H. Cutler, Clerk and Treasurer.

Naugatuck.—At the annual meeting in Bridgeport, Conn., Nov. 21, the following directors were chosen: F. J. Kingsbury, Waterbury, Conn.; R. M. Bassett, Derby, Conn.; H. M. Bronson, J. B. Robertson, New Haven, Conn.; J. G. Wetmore, Winsted, Conn.; E. F. Bishop, W. D. Bishop, R. Tomlinson, Bridgeport, Conn.; A. L. Dennis, Newark, N. J. The board re-elected E. F. Bishop, President; George W. Beach, Superintendent; Horace Nichols, Secretary and Treasurer; Samuel Wilmot, Auditor.

New Haven & Derby.—At the annual meeting in New Haven, Conn., Nov. 21, the following directors were chosen: R. M. Bassett, Wm. E. Downs, Birmingham, Conn.; J. H. Bartholomew, F. Farren, Thomas Wallace, Ansonia, Conn.; Isaac Anderson, Charles Atwater, Charles L. English, Herick P. Frost, J. A. Sperry, N. D. Sperry, John P. Tuttle, M. T. Tyler, New Haven, Conn. The New Haven city directors, chosen by the City Council, are R. W. Armstrong and Henry G. Lewis.

Ohio.—The directors of this new company are: Arthur L. Conger, David E. Hill, George R. Hill, Arthur Latham, Edward Miller, Lewis Miller, Akron, O.; Richard P. Flood, Canton, O. The board elected Lewis Miller, President; Richard P. Flood, Secretary; Arthur L. Conger, Treasurer; O. D. Leisenring, Chief Engineer.

Ohio Central.—The United States Circuit Court has appointed Thomas R. Sharpe Receiver of this road in West Virginia.

Philadelphia, Wilmington & Baltimore.—Mr. H. D. Gordon has been appointed Master Mechanic in place of S. A. Hodgman, resigned. Mr. Gordon has had long experience, and for some time past has been General Foreman of the Wilmington shops.

Plant Investment Co.—At the annual meeting, Nov. 16, the following directors were chosen: W. S. Chisholm, Savannah, Ga.; B. F. Newcomer, Baltimore; Lorenzo Blackstone, Norwich, Conn.; Henry Sanford, Bridgeport, Conn.; G. H. Tilley, Darien, Conn.; Morris K. Jesup, Henry B. Plant, New York. The company owns the Savannah, Florida & Western road and its branches, the Charleston & Savannah road and the South Florida road, besides steamboat lines on the Apalachicola, Flint, St. Johns and Suwanee rivers.

Railway Passenger & Freight Conductors' Mutual Aid & Benefit Association.—At the annual meeting in Chicago last week the following officers were elected: President, Robert Loughlin, Flint & Pere Marquette; Vice-Presidents, John W. Mallory, Atchison, Topeka & Santa Fe, and W. A. Reagan, East Tennessee, Virginia & Georgia; Secretary and Treasurer, Charles Huntington, Chicago & Alton; Directors, George Hewitt, New York, Chicago & St. Louis; Thomas P. Robb, Chicago & Grand Trunk; F. X. Vevia, Pittsburgh, Ft. Wayne & Chicago; H. S. Gray, Wabash, St. Louis & Pacific; John S. Cooper, Chicago & Alton; W. F. Wagner and James Curran, Lake Shore & Michigan Southern.

Richmond, Fredericksburg & Potomac.—At the annual meeting in Richmond, Va., Nov. 21, the following were chosen: President, J. P. Brinton; Directors, A. Sydney Biddle, J. S. Blackburn, Charles Chauncey, F. T. Willis.

Rochester & Pittsburgh.—Mr. J. R. Sherburne has been appointed foreman in charge of the shops at Buffalo.

Rome, Watertown & Ogdensburg.—The following circular from General Manager H. M. Britton is dated Nov. 10:

"Mr. W. W. Currier is appointed Superintendent of Transportation of this company, with office at Oswego, N. Y. He will have charge of the ordering and distributing of all cars. All reports of this department will be sent to him."

Savannah, Griffin & North Alabama.—At the annual meeting in Griffin, Ga., recently, the following were chosen: President, W. G. Raoul; Directors, W. W. Fitts, A. D. Free, man, J. N. Horne, A. Hutchinson, W. W. Merrill, H. J. Sargent, John D. Stewart, U. B. Wilkinson.

Toledo Belt.—This company was organized at Toledo, O., Nov. 13, by the election of the following directors: M. D. Carrington, George W. Davis, Noah H. Swayne, Jr., M. D. Woodford, Toledo; George J. Forrest, New York. The board elected M. D. Carrington President; George J. Forrest, Vice-President; M. D. Woodford, General Manager; S. H. Ayres, Secretary and Treasurer.

Toledo, Cincinnati & St. Louis.—Mr. Charles A. Bell is appointed Superintendent of the Cincinnati Division in place of D. T. Bacon, resigned.

Valley of Virginia.—At the annual meeting last week Samuel Spencer, of Baltimore, was re-elected President, with the old board of directors.

Watertown & Waterbury.—This company has elected Wm. D. Bishop President; L. W. Cutler, Secretary and Treasurer. The road is leased to the Naugatuck Company.

Wrightsville.—This company was recently organized with the following directors: A. F. Daley, T. W. Kent, M. H. Mason, Wrightsville, Ga.; S. M. Perkins, Perkins Junction, Ga.; G. B. Harrison, Tenuille, Ga. The board elected S. M. Perkins President; M. H. Mason, Secretary; A. F. Daley, Treasurer.

PERSONAL.

—It is reported that Mr. J. D. Laying has tendered his resignation as General Superintendent of the Chicago & Northwestern road.

—Mr. A. K. Mansfield has resigned his position as Mechanical Engineer of the New York & New England Railroad, to date from Nov. 17.

—Major J. M. Eddy has resigned his position as Superintendent of the Texas & Pacific, and will, it is said, accept a position on an eastern road.

—Mr. James C. Ernst has resigned his position as General Passenger Agent of the Chicago, St. Louis & Pittsburgh road, and will enter into a manufacturing business at Covington, Ky., where he formerly lived.

—Mr. John W. Garrett, President of the Baltimore & Ohio, has suffered a great loss in the death of his wife, which occurred at her country house, Montebello, near Baltimore. The cause of Mrs. Garrett's death was the injuries she received by being thrown from her carriage five weeks ago.

—Mr. Wm. G. Harrison died in Baltimore, Nov. 18, aged 81 years. He was born and always lived in that city and was for many years a prominent and successful merchant there, serving the city also in the Legislature. He was for a number of years a director of the Baltimore & Ohio Co., and was its President for three years, being succeeded in office by Mr. Chauncey Brooks. He was also for many years a director of the Canton Co. and for a time President of the Union Railroad Co. Mr. Harrison leaves a large fortune.

—Mr. S. A. Hodgman having resigned his position as Master Mechanic of the Philadelphia, Wilmington & Baltimore road to become Mechanical Superintendent of the Loddell Car Wheel Co., in Wilmington, Del., the men recently under his charge last week presented him with a very handsome silver service. The presentation was made at the shops, Mr. James H. Price, Chief Clerk, making an address expressing the general feeling of regret at parting with Mr. Hodgman. That gentleman responded in an appropriate manner.

—Mr. Bradford Dunham, the new General Manager of the Louisville & Nashville road, is not a stranger on that line, having served for several years as superintendent of the South & North Alabama. Mr. Dunham is a Georgian, and had been, for some time, on railroads in that state in subordinate positions when he was made General Superintendent of the Montgomery & Enfield. From that road he went to the Louisville & Nashville, having charge of the South & North Alabama, and afterwards of the Mobile & Montgomery also. He left the road early in 1881 to take the position of General Manager of the Trans-Ohio lines of the Baltimore & Ohio, which he has since held.

—A dispatch from London, England, Nov. 20, says: "Dr. Charles William Siemens, the well-known scientist, engineer and electrician, died to-day of rupture of the heart."

He was 63 years of age. Ten days ago he fell in Park Lane, London, and went to his home in great pain. His physician ordered complete rest, and he was apparently recovering until yesterday, when he became worse, and rapidly sank until death ensued.

Dr. Siemens was born in Leuthen, in Hanover, April 4, 1823, received his education at Lubeck, Magdeburg and Göttingen, and entered as a pupil the engine works of Count Stolberg in 1842. He visited England in 1843, and after a brief absence returned there in 1844, and lived thereafter in England, becoming a naturalized subject in 1859. For the past 40 years he has had an almost continuously brilliant career in the foremost ranks of scientific engineering and metallurgy, and as an electrician, but especially in steel production and telegraphic progress. The deceased came of a family remarkable for its ability.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

Ten months ending Oct. 31:					
	1883.	1882.	Inc. or Dec.	P. c.	
Ala. Gt. South....	\$845,063	\$663,887	I.	\$181,176	27.0
Cin., N. O. & T. P.	2,126,544	2,115,494	I.	11,050	0.5
Cleve., A. & Col.	448,871	422,327	I.	26,544	6.3
Des M. & Ft. D.	276,102	280,756	D.	10,654	3.7
Florida Cen. & W.	343,051	330,130	I.	12,921	3.9
Flor. Trans. & P.	380,933	329,528	I.	70,405	21.3
Gulf, C. & S. F.	1,691,892	1,142,869	I.	549,023	48.0
Hous., E. & W. T.	266,331	215,452	I.	50,879	23.7
Net earnings....	168,243	.....	.....	.....	.....
Rich. & D. lines:					
Char., C. & A.	608,422	589,178	I.	79,244	13.3
Net earnings....	298,183	149,401	I.	148,782	98.6
Col. & Green....	602,192	592,507	I.	9,685	1.6
Net earnings....	196,280	113,578	I.	82,702	72.6
Rich. & Danville	3,146,808	2,978,062	I.	168,746	5.7
Net earnings....	1,351,189	1,003,200	I.	347,989	34.7
Va. Midland....	1,413,296	1,244,526	I.	168,760	13.5
Net earnings....	606,765	470,551	I.	136,214	28.8
Western N. C....	312,121	300,510	I.	11,611	55.8
Net earnings....	111,128	45,129	I.	65,999	146.7
St. L. & Cairo....	326,448	309,305	I.	17,143	5.5
Nine months ending Sept. 30:					
Union Pacific....	\$21,551,287	\$21,972,764	D.	421,477	2.0
Net earnings....	10,050,506	10,491,783	I.	441,277	4.2
Month of September:					
L. E. & St. L....	\$72,600	.....	.....	.....	.....
Union Pacific....	2,994,076	\$3,170,315	D.	\$176,239	5.5
Net earnings....	1,458,888	1,909,723	D.	450,835	23.6
Month of October:					
Ala. Gt. South....	\$112,147	\$88,714	I.	\$23,433	26.3
Cin., N. O. & T. P.	260,673	240,384	I.	20,289	8.4
Cleve., A. & Col.	49,070	54,718	D.	5,648	10.3
Des M. & Ft. D.	37,571	35,595	I.	1,976	5.3
Florida Cen. & W.	42,330	37,700	I.	4,630	12.3
Florida Tran. & P.	47,186	36,385	I.	10,801	30.0
Gulf, C. & S. F.	263,436	227,506	I.	35,930	15.7
Hous., E. & W. T.	37,428	24,106	I.	13,322	55.5
Rich. & D. lines:					
Char., C. & A.	98,205	99,125	D.	920	0.9
Col. & Green....	80,247	113,806	D.	27,559	24.2
Rich. & Danville	429,834	421,706	I.	8,128	1.9
Va. Midland....	176,167	167,017	I.	9,150	5.3
Western N. C....	44,006	26,897	I.	17,109	63.4
St. L. & Cairo....	40,384	36,548	I.	3,836	10.5
St. L., Ft. S. & W.	35,398	.....	.....	.....	.....
Tol. Cin. & St. L.	128,000	92,441	I.	35,559	38.6
First week in November:					
Bu. C. Rap. & N.	\$74,765	\$69,824	I.	\$4,881	6.9
Chi. & Gd. Trunk	59,380	53,318	I.	6,062	11.4
Cin. & W. & Balt.	39,556	39,390	I.	166	0.4
Grand Trunk....	395,780	394,097	I.	1,683	0.3
Or. Ry. & N. Co.	143,636	149,078	I.	44,558	45.0
Second week in November:					
Bu. C. Rap. & N.	\$71,616	\$65,093	I.	\$6,523	10.0
Canadian Pacific	129,000	129,000			
Chi. & Alton....	200,200	200,573	I.	3,627	1.8
Chi. & E. Ill....	32,099	36,550	D.	4,451	12.2
Chi., M. & St. P.	548,000	477,481	I.	70,519	14.8
Chi. & Northwest	538,400	446,800	I.	91,600	20.5
C. St. P. M. & O.	134,100	125,700	I.	8,400	6.0
Denver & R. G.	157,900	125,900	I.	32,000	25.4
Long Island....	45,148	43,013	I.	2,135	3.5
Louis. & Nash....	295,118	272,027	I.	23,091	7.8
Mil. & S. & W.	24,069	18,276	I.	5,793	31.5
Mo. Pacific lines	839,788	803,297	I.	36,491	4.5
W. St. L. & P.	391,316	331,063	I.	60,253	18.2
Northern Pacific	296,400	195,336	I.	101,064	51.9
Or. Ry. & N. Co.	145,807	92,271	I.	53,536	58.2
Rochester & Pitt.	18,800	6,496	I.	12,304	189.3
St. L. & San Fran.	93,500	72,800	I.	20,700	28.4
St. P. & Duluth..	35,974	29,700	I.	6,274	20.7
St. P., M. & M.	195,300	181,400	I.	13,900	7.6

Weekly earnings are usually estimated in part, and are subject to correction by later statements.

Grain Movement.

For the week ending Nov. 10 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past ten years:

Northwestern shipments.				
Year.	Northwestern receipts.	Total.	By rail.	P. c.
1874....	2,584,330	2,537,220	297,809	11.8
1875....	3,213,054	3,419,362	1,143,631	33.5
1876....	2,916,023	3,739,754	1,372,271	36.7
1877....	3,676,648	4,147,443	426,584	10.3
1878....	4,609,154	4,268,616	732,892	17.1
1879....	3,918,984	2,978,882	1,106,435	37.1
1880....	5,685,595	5,039,906	1,767,414	35.1
1881....	3,907,872	3,688,621	1,718,713	46.6
1882....	5,034,019	3,567,249	1,751,257	49.1
1883....	5,042,156	4,245,448	2,375,648	56.0

The receipts of the Northwestern markets for the week were 908,000 bushels more than in the corresponding week of last year, and more than in any previous year. They were, however, 78,000 bushels less than in the previous week of this year, and the smallest for the three months. There has usually been a sharp falling off at this time last year and in 1879 and 1880 the decrease in the corresponding week from the previous week was more than a million.

The shipments of these markets were exceeded in the corresponding weeks of 1880 and 1878, but in no other years. The rail shipments were much larger than in the corresponding week of any previous year, and have been equalled but seven weeks since navigation opened this year. The shipments down the Mississippi were 195,573 bushels, or 4.6 per cent. of the whole. The lake shipments were exceptionally small, and will soon cease. They were but 1,674,000 bushels, and this is the first week they have been less than 2,600,000 bushels since July.

The Atlantic receipts of the week were 895,000 bushels less than in the corresponding week of last year, and smaller than in any year since 1874. They were also 143,000 bushels less than in the preceding week of this year, and the smallest since July. The shipments from the West continue to be absorbed to a wonderful extent before they reach the seaboard.

In the distribution of the Northwestern receipts the chief change from the previous week is a decrease of 176,000 bushels at St. Louis. In Atlantic receipts there is a decrease of 553,000 bushels at New York and a gain of 323,000 at Boston. The Boston receipts are the largest of the

year, and larger than in any week of 1882. The New York receipts are the smallest since the middle of August.

Exports from Atlantic ports for the week ending Nov. 20 for four successive years have been:

	1880.	1881.	1882.	1883.
Flour, bbls.....	172,071	115,408	181,056	147,027
Grain, bush.....	4,292,401	2,263,769	1,179,416	2,213,822

The exports this year were nearly one-half greater than last year, and nearly the same as in 1881, but not half as great as in 1880.

San Francisco exports in October were 104,927 barrels of flour and 2,500,233 bushels of wheat. For the four months of the California crop year from July 1 to October 31 the exports were as follows, flour in barrels and wheat in bushels, flour being reduced to wheat in the totals:

	1883.	1882.	Inc. or Dec.	P. c.
Flour	352,254	341,710	I. 10,544	3.1
Wheat.....	7,891,783	9,169,050	D. 1,277,267	13.9
Total, bushels...	9,653,033	10,877,000	D. 1,224,547	11.3

Total, bushels.... 9,653,053 10,877,000 D. 1,224,547 11.3

About half the flour this year went to Great Britain and about one-third to China, the rest being scattering shipments, chiefly to Central America and the Pacific islands. Nearly all the wheat went to Great Britain.

Coal.

Coal tonnages for the week ending Nov. 10 are reported as follows:

	1883.	1882.		Inc. or Dec.	P. c.
Anthracite.....	725,827	669,867	I.	55,960	8.4
Semi-bituminous...	117,767	128,714	D.	10,947	8.5
Bituminous, Penna.	71,104	61,386	I.	9,718	15.8
Coke, Penna....	63,811	54,481	I.	9,330	17.1

The anthracite market is more active, the sudden incoming of cold weather having increased the demand for domestic use.

Cumberland shipments show a decrease from the preceding week, but there was a considerable increase in Clearfield tonnage.

The coal tonnage of the Pennsylvania Railroad for the week ending Nov. 10 was:

	Coal.	Coke.	Total.
Line of road.....	155,918	53,130	209,048
From other lines....	51,079	10,681	61,760

Total..... 206,997 63,811 270,808

The total tonnage this year to Nov. 10 was 10,480,273 tons, against 9,493,301 tons for the corresponding period last year, an increase of 986,972 tons, or 10.4 per cent.

Anthracite coal tonnage for October and the ten months ending Oct. 31 is reported as follows, by the Official Accountant, Mr. John H. Jones, the statement including the entire production of anthracite coal, excepting that consumed by employees and for steam and heating purposes about the mines:

	1883.	1882.	1883.	1882.
Phila. & Reading....	1,328,809	727,809	8,494,686	5,639,994
Central of N. J.....	410,461	1,745,399	3,485,091	4,461,461
Lehigh Valley.....	657,243	663,281	5,235,464	4,840,599
Del. & Lack. & W....	543,515	470,080	4,218,650	3,813,712
Del. & H. Canal Co..	379,478	392,237	2,910,342	2,563,220
Pennsylvania R.R....	298,900	226,224	2,288,787	1,973,329
Penn. Coal Co.....	180,087	136,453	1,276,682	1,292,423
N. Y., L. E. & W....	38,241	22,432	306,783	217,926

Total..... 3,426,273 2,945,037 26,401,793 23,723,284

The tonnage of the Central Railroad of New Jersey is included in the Philadelphia & Reading statement, from June 1, 1883. The Lehigh Valley tonnage includes that of the State Line & Sullivan road, which was 9,275 tons in October, 1883. In addition to the tonnage credited above, there were 61,928 tons transported from mines in October by the Delaware & Hudson Canal Co., which is included in tonnage of other interests.

The increase for October was 481,236 tons, or 16.3 per cent. The increase for the ten months was 2,738,509 tons, or 11.5 per cent. All the companies (including Reading and New Jersey Central together as one) show increases, both for October and the ten months.

The proportion of the total tonnage credited to each company was as follows for the ten months, Reading and New Jersey Central being taken together for the whole of this year:

	1883.	1882.	Inc. or Dec.	P. c.
Phila. & Reading....	38.7	23.7	I.	0.3
Central of N. J.....	14.7	14.7		
Lehigh Valley.....	19.7	20.4	D.	0.7
Del. & Lack. & Western	15.9	16.1	D.	0.2
Del. & Hudson Canal Co.	11.0	10.8	I.	0.2
Pennsylvania R. R. Co.	8.7	8.3	I.	0.4
Pennsylvania Coal Co.	4.8	5.1	D.	0.3
N. Y., Lake Erie & Western	1.2	0.9	I.	0.3
Total.....	100.0	100.0		

The changes here shown are slight, all of them being less than 1 per cent. Upon the whole it may be said that all of the companies have held their own proportions of the trade remarkably, and that the complete statement for the year will probably show very little change. The total output of anthracite for the year will probably run over 33,000,000 tons, against 29,120,000 in 1882 and 28,500,000 in 1881.

The stock of coal on hand at tidewater shipping points Oct. 31 was 604,865 tons, against 538,490 tons on Sept. 30, an increase of 66,375 tons, or 12.3 per cent., during the month.

Cumberland shipments for the week ending Nov. 17 were 43,305 tons. The total shipments this year to Nov. 17 were 2,226,264 tons.

Cotton.

Cotton movement for the week ending Nov. 16 is reported as follows, in bales:

	Interior markets—		Seaports—	
	Receipts.	Shipments.	Receipts.	Exports.
1883	145,839	115,159	242,078	207,921
1882	187,767	146,384	259,154	160,365

Total receipts at interior markets for the crop year (from Sept. 1) to Nov. 16 were 1,263,700 bales; the stock reported Nov. 16 was 343,929 bales, against 244,123 a year ago. The heaviest receipts reported for the week were at Memphis, 28,295; Houston, 27,897, and St. Louis, 17,524 bales.

Total receipts at seaports to Nov. 16 were 1,975,589 bales; stock, Nov. 16, was 842,179 bales. The heaviest receipts for the week were at New Orleans, 81,438; Norfolk, 38,470; Savannah, 31,370, and Galveston, 30,117 bales.

Immigration in October.

The Bureau of Statistics reports the arrival of 48,865 immigrants in October, and of 501,037 in the ten months ending with October. For three successive years the arrivals in October and the ten months have been:

	1881.	1882.	1883.	1881.	1882.	1883.
Oct.	67,929	45,965	48,865	630,890	648,051	501,037

The small increase over last year in October is another indication that the decline in immigration which began after July last year has been arrested. For the four months since June the arrivals this year have been 179,192, against 208,986 last year and 239,734 in 1881. The

decrease from 1881 to 1882 was thus 35,748; that from 1882 to 1883 only 24,794. Three-fourths of the decrease this year was in July.

Large Cargo Through the Mississippi Jetties.

A telegram from New Orleans, Nov. 14, says: "The British steamship 'Silvertown' left her wharf this morning for Liverpool, with 10,618 bales of cotton, 24,128 bushels of corn, 300 tons of oil-cake, and 13,000 staves. At the time of sailing her draft was 25 ft. 2 in. aft, and 22 ft. 6 in. forward. She went to sea through the jetties to-night without any assistance or detention. This is the largest cargo of cotton ever carried by any vessel. In fact, next to the 'Great Eastern,' the 'Silvertown' is the largest freight-carrier afloat. The heaviest draft vessel that ever went through the jetties was the 'Rochester,' for Havre, last January, drawing 26 ft. 3 in. The 'City of New York' went through on Nov. 6, drawing 25 ft. 3 in."

Kansas Commission Rates.

A dispatch from Topeka, Kan., Nov. 16, says: "At the meeting with the traffic managers yesterday the Board of Railway Commissioners agreed to accept the distance rates proposed by the managers on through freight, provided they shall be applied under the same conditions that the tariffs have been applied heretofore. It is thought this will make a reduction of about 10 per cent. The managers asked 30 days to consider whether they would accept. It was demonstrated to be wholly impracticable, on account of the conditions prevailing on the different lines, to adopt uniform rates. Therefore the board proposed to meet a representative of each road and prepare a schedule of rates. Without saying whether they would do this the managers left here, except Mr. Emerson, of the Missouri Pacific Co. He remained to prepare a schedule for that road. The Missouri Pacific, the Union Pacific, the Fort Scott & Gulf and the St. Louis & San Francisco roads can probably all be covered by a uniform tariff."

Third—All tickets of first and second class by way of the Pennsylvania and the Chicago, Milwaukee & St. Paul Railways to Council Bluffs and Omaha.

Fourth—All tickets resuming by the way of the Baltimore & Ohio and the Chicago, Milwaukee & St. Paul Railways to Council Bluffs and Omaha.

The reason for this order is the irregularities said to be practiced in the passenger departments of the Northwestern roads, the main irregularity consisting in the payment of commissions to middlemen and brokers. It is intended by the present action to compel the Northwestern roads to form a pool to co-operate with that of the trunk lines, and to restrict the payment of commissions to agents.

Iowa Trunk Lines Association.

The Chicago, Milwaukee & St. Paul Co. has given the required 30 days' notice of its intention to withdraw from the Omaha pool. It is thought possible that this intention may not be carried out, but that the differences which have caused the company to give notice may be adjusted before the 30 days expire.

New York State Canals.

Notice is given that the New York State canals will be closed for the season on Dec. 1, unless sooner closed by ice, of which there seems to be no present probability.

Cleveland Iron Ore Traffic.

The receipts and shipments at Cleveland, which is the chief distributing port for Lake Superior ore consumed in the East, have been, for the past two seasons, in tons:

	1883.	1882.	Decrease.	P. c.
Receipts.....	663,807	993,048	329,241	33.2
Shipments.....	644,331	978,735	334,404	5.1

Though a great deal of ore is consumed at Cleveland, the shipments probably represent the course of consumption in the territory supplied by Cleveland better than the receipts. A great stock is always accumulated at the close of the season of navigation, to last until the lakes open in the spring. There was doubtless an excess in accumulation of stocks last year, and a smaller one this year as a smaller consumption is anticipated. A great falling off in ore shipments is likely to result in increasing the number of vessels in the grain trade and reducing rail shipments from Lake Michigan ports; but this has not been the case this year. Grain notes have been higher than last year, especially in the fall, when the demand for ore may be supposed to have fallen off. The cause probably is that grain shipments have increased more than ore shipments have decreased, so that on the whole there was better employment for vessels.

OLD AND NEW ROADS.

Augusta, Elberton & Chicago.—At the recent annual meeting Chief Engineer C. S. Dwight submitted the following report:

"There have been completed up to this date 4.18 miles of roadbed, beginning at the junction with the Augusta & Knoxville Railroad. This work has been done, and at a cost considerably within the lowest bid received.

"The material on the first mile and a quarter was exceedingly favorable—a light sandy soil; but on the remainder a very tough clay was encountered in all the cuts, requiring the use of powder to move it, even a heavy plow drawn by six mules having failed to break it for the shovel.

"While a considerable portion of the work is quite light, at least 1½ miles are by no means so, but might almost be called heavy, in profile and character of material.

"Had the fund at command justified the purchase of a complete outfit at the beginning the grading could have been done even more economically and expeditiously."

Baltimore & Ohio.—The annual meeting of this company was held at Camden Station, Baltimore, Nov. 19. President Garrett was unable to be present, owing to the death of his wife, and out of respect to him no business was transacted, and the stockholders adjourned for one week, until Monday next.

Bellaire, Zanesville & Cincinnati.—Regular trains will begin to run over this road next week between Bellaire, O., and Caldwell, 82 miles. Work is being pushed on the line between Caldwell and Zanesville.

Black Hills & Montana.—This company recently filed articles of incorporation, its headquarters being at Cheyenne, Wyoming. The road projected will start from Cheyenne, thence running northward along the best practicable route it will strike the North Platte River. From the North Platte there will be two branches, one of which will go to the Black Hills and the other to a point in Montana. The capital stock is \$10,000,000.

Boston & Lowell.—The Boston Advertiser of Nov. 16 says: "A conference of representatives of the directors of the Boston & Lowell and the Grand Trunk railroads was held at the Boston & Lowell station, in this city, yesterday, to consider the informal proposition of the Grand Trunk to lease the Boston & Lowell road. President Abbott and directors Morey and Coolidge represented the home road, and quite an important meeting was held, the result of which is not made public further than this: That no agreement for a lease was reached, nor was any formal proposition for a lease accepted. As has already been mentioned, there are several obstacles in the way of such an operation, perhaps foremost among which may be placed the fact that during the past year the Boston & Lowell has come up by increased earnings from a 5 per cent. to a 6 per cent. road; while the large expenditures for equipment, stations and improvements to road-bed, all of which have been charged to working expenses, show earnings equivalent to a still larger percentage and warrant the expectation of still larger dividends in the near future. While it is true, therefore, that a lease of the Boston & Lowell is probable, provided a guarantee of rental commensurate to what the stockholders consider the earning capacity of the road be given, it is at least doubtful if the Grand Trunk and the Central Vermont, which are supposed to be interested in the proposed lease, will be disposed to pay such a rental. It is pretty certain that the Boston & Lowell directors will not go so far as to submit to their stockholders any proposition looking to the payment of 6½ or 7 per cent. rental, as has been talked of."

Boston & Providence.—The shops of this company at Roxbury, Mass., caught fire on the morning of Nov. 16, and the machine shop, boiler and engine house and part of the store-house were destroyed, causing a loss of about \$20,000, besides the delay of pressing work.

Canadian Pacific.—The following circular is issued from the President's office: "Notice is hereby given that 30 days after this date (Nov. 20) the Canadian Pacific Railway Co. will issue the balance of its authorized capital stock, amounting to \$45,000,000.

"This issue will be made in pursuance of an agreement, entered into Nov. 10, 1883, by and between the Government of the Dominion of Canada, the Bank of Montreal, trustee, and the Canadian Pacific Railway Co. (of which public

notice was given Nov. 12, 1883), whereby a guaranteed minimum dividend of 3 per cent. per annum, for 10 years, is granted by the said government, on the entire capital stock of the Railway Co., amounting, when this notice expires, to \$100,000,000.

"In all, \$35,000,000 of the said \$45,000,000 now about to be issued will remain on deposit with the government, and will be withdrawn by the Railway Co. only when and as its requirements in connection with the completion of the railroad call for it."

Central Massachusetts.—The Boston Advertiser of Nov. 17 says: "Only 50 or thereabouts of the 95 remaining bonds of the old Massachusetts Central Railroad Co. are likely to remain out when the newly organized corporation gets actively at work. The whereabouts of these bonds is not known, and in all probability they will not come in. The directors of the new company at their meeting this week voted to have the necessary surveys for the completion of the line to Northampton made at once, and the work of construction will begin as soon thereafter as is possible. A circular will be issued within a few days to the common stockholders, calling their attention to the fact that the time for the exchanging of their stock for the new stock expires Feb. 10, and requesting them to make the exchange as soon as possible. Where towns hold the stock it will be necessary for action to be taken at a town meeting, and in such cases it is desirable that the meeting be called immediately. No action has yet been taken regarding the reopening of the completed portion of the road, but it is probable that some arrangement will soon be made with the Boston & Lowell to operate it."

Central, of New Jersey.—One of the large freight houses at Communipaw, N. J., caught fire on the morning of Nov. 17, and was destroyed, with 25 box cars and a large quantity of valuable freight. The loss is said to be about \$150,000. The other buildings adjoining were saved by hard work.

Chain of Rocks Bridge.—This company has filed articles of incorporation in Illinois to build a bridge over the Mississippi River at Chain of Rocks, about 10 miles above the bridge at St. Louis.

Chesapeake, Ohio & Southwestern.—The following circular from General Superintendent D. W. C. Brown is dated Louisville, Ky., Nov. 12:

"At 10 o'clock a. m., Sunday, Nov. 18, the standard time of this railroad will be changed to that of the 90th Meridian, known as the Central Standard, which is about 18 minutes slower than Louisville time—the present standard.

"The Superintendent of Transportation will arrange to put this new standard into effect, and all employees of the Transportation, Mechanical, and Road departments must observe his instructions in regard thereto."

Chest Creek.—This company has been organized to build a railroad from Kaylor, Pa., on the Ebensburg Branch of the Pennsylvania Railroad, by Westover and Newbury to the mouth of Chest Creek in Clearfield County. The distance is 35 miles.

Chicago, St. Paul, Minneapolis & Omaha.—The new branch of the Nebraska Division is now completed to Hartington, Neb., 10 miles northwest from the late terminus at Coleridge, and 30 miles from the junction with the Norfolk Branch at Wakefield.

On the Chippewa Falls & Northern branch, the track is reported laid to Chicago Junction Wis., on the Northern Division, 23 miles beyond the late terminus at Rice Lake, and 80 miles from Eau Claire.

Cincinnati & Eastern.—The Cincinnati News-Journal of Nov. 17 says: "Receiver Woodward closed a contract yesterday with the Cleveland Rolling Mills Company for 1,200 tons of 56-pound steel rails. This trade has been pending for some time, owing to the efforts of certain parties to have the Receiver restrained from issuing certificates of indebtedness against the property, the Rolling Mill Co. holding off until the matter was settled by the courts. Yesterday they wired the Receiver that they would take certificates at par for all the rails that might be required to complete the road to Portsmouth, and that they would engage to deliver the whole amount in Cincinnati by the middle or last of next week. The Receiver immediately accepted the proposition and ordered 1,200 tons, as before stated. The Cincinnati & Eastern Co., in its own name, has ordered 10 locomotives, 100 flat, 100 box, 100 stock, 50 coal, and 4 passenger cars, all of the standard gauge, which will be ready for delivery by the time the Receiver is ready to change the gauge of the line. This additional equipment will be paid on the car trust plan, in 60 monthly payments, the deferred amounts drawing interest at the rate of 7 per cent. per annum."

Colorado Northern.—This company (formerly the Denver, Longmont & Northwestern) will hereafter operate its own road, which has been for some time past worked by the Denver, Utah & Pacific Co. under agreement.

Danville, Olney & Ohio River.—A meeting of the bondholders was held in Boston, Nov. 20. The Committee presented a report sharply criticising the plan of reorganization proposed by the trustees, and also the management of the Receiver. The report said that the road was in very bad condition, and was earning much less than its working expenses. The Receiver defended himself, and there was a very sharp discussion, which ended in a vote discharging the Committee. The meeting then adjourned without taking any further action.

Des Moines, Creston & Kansas City.—The contract for building this road from Des Moines, Ia., to Creston has been let to Holmes, Jackson & Co., of Indianapolis, Ind., who are to begin work at once.

Des Moines, Osceola & Southern.—This road is now completed to Cainesville, Mo., about 10 miles south of the Iowa line. The new terminus is 24 miles southward from the late terminus at Leon, Ia., and 124 miles from Des Moines. Regular trains now run through.

Eastern.—The location of the Danversport Branch has been approved by the Railroad Commissioners and it will be built at once. It is a spur only one-half mile long, from the station at Danversport, Mass., to the Tompkins Rolling Mill, and will be used for freight only.

Fargo Southern.—The litigation with the St. Paul, Minneapolis & Manitoba Co. over the crossing at Wahpeton, Dak., promises to continue for some time, as the Manitoba Co. is evidently disposed to fight the new road in every possible way.

Track is now laid from Fargo, Dak., southward to Wild Rice, 11 miles, and work is progressing steadily. Track-laying has also been begun from Ortonville northward.

Fitchburg.—This company will, on Dec. 1 next, reduce its ticket rate to 2½ cents per mile between Boston and Fitchburg and intermediate points, and to 2½ cents between Fitchburg and North Adams. Mileage tickets are to be issued at the same rates as at present, 500 miles for 2½ cents and 2,000 miles for 2 cents per mile. The present

season and five ride tickets between Boston and Waltham and intermediate points are to be superseded by 100-ride and 10-ride tickets. The price of single tickets will also be reduced between Boston and stations beyond Brickyard. The 10 and 100-ride tickets will be good for anybody who holds them and for any person accompanying the holder. The rates for the 100-ride tickets do not differ very much from the present season-ticket rates, while the new tickets will have considerable advantages in point of convenience.

Florida Southern.—Track is reported laid on this road to Lake Weir, Fla., 18½ miles south of the old terminus at Ocala, and 90½ miles from Palatka. A branch has also been completed from Micanopy Junction to Micanopy, 3½ miles.

Georgia Pacific.—The track is now laid through the Cane Creek tunnel and on the gap of 5 miles west of that tunnel, completing a continuous line from Atlanta, Ga., westward to Birmingham, Ala., 168 miles. Through trains began to run Nov. 19. The completion of the road gives Atlanta a direct connection with the coal region of Alabama, which is of importance to the manufacturing interests of that city, as enabling them to secure a cheap and constant supply of coal.

Grand Trunk.—The track on this company's Michigan Air Line Division is now laid to Stockbridge, Mich., 30 miles westward from the late terminus at South Lyon, and 71 miles from the junction with the Detroit Division at Ridgway. About 19 miles remain to complete the line to Jackson, upon which work is in progress.

Houston, East & West Texas.—This company makes the following statement for October.

	October—	1882.	Ten months—	1883.
Earnings.....	\$37,428	\$24,106	\$266,331	
Expenses.....	10,841	9,360	98,088	
Net earnings.....	\$26,587	\$14,746	\$168,243	
Per cent. of expenses.....	20.0	38.8	36.8	

For October there was an increase of \$13,322, or 55.5 per cent., in gross earnings, with an increase of \$1,481, or 15.7 per cent. in expenses, and a resulting gain in net earnings of \$11,841, or 80.3 per cent. The net earnings were applied to payment of the floating debt.

Indiana Coal.—This company has filed articles of incorporation to build a railroad from Jasper, Ind., the terminus of a branch of the Louisville, Evansville & St. Louis road, northward to Linton in Greene County, a distance of about 50 miles.

Louisville, New Albany & Chicago.—The following order was issued by General Superintendent John McLeod, dated Louisville, Ky., Nov. 12: "At 12 o'clock noon, of Sunday, Nov. 18, 1883, the standard time of this company will be changed to conform to the time of the 90th meridian, designated as Central Time, and 9 minutes slower than Chicago time, which is now the standard time governing the movement of trains on this railway. No change will be made in the time card now in force."

Louisville, New Orleans & Texas.—The grading of this road is now completed from Baton Rouge, La., northward 38 miles, and track-laying has been begun at Baton Rouge. From Port Gibson, Miss., southward the grading has been pushed, and less than 20 miles remain to be completed between that place and the Louisiana line. South of Port Gibson there are several deep cuts, the completion of which has required much time. The bridge over the Homochitto River, a difficult work, is now nearly finished.

On the northern end of the road the track is now laid for 37 miles southwest from Memphis, Tenn., and work is progressing steadily.

Maine Central.—A dispatch from Augusta, Me., says that the committee of the Maine Central Railroad stockholders on the matter of consolidating the Eastern, the Boston & Maine and the Maine Central roads, held a meeting Saturday afternoon, and, after discussing the subject in all its bearings, voted to send a letter to President Lord of the Boston & Maine, the substance of which is that between now and the annual meetings of the roads in December for the choice of officers the time is inadequate to consider the scheme of consolidation.

Memphis & Charleston.—At the annual meeting, Nov. 20, the stockholders voted to authorize the issue of \$1,000,000 new bonds to purchase equipment and pay off floating debt.

Mexican Central.—The Mexican Financier of Nov. 3 says: "A remarkable feature of the building of the Mexican Central is the continual shortening of the time which will bring about its completion. A few months ago, and it was believed that communication between this capital and the United States would not be established before September, 1884. Then it was believed that it might be possible to celebrate the event on the Fourth of July. Next it was announced that the two ends would meet by May 1, so that the celebration would take place on May 5. A few weeks later, and so rapid was the progress on the Northern Division that the management said that the road would be completed in March. The time for completion was next shortened another month, that is, to February; and now it is said that at the present rate of construction the two ends of the track will meet some time in January. Construction on the northern division is not going on so rapidly as it was, owing to a lack of rails, but enough material is coming forward at present to enable the laying of about a mile a day, while at this end they are laying about two kilometres a day, on an average. At last accounts the track was something over 50 kilometres north of Aguascalientes, so that Zacatecas would easily be reached early in December."

"There are just about enough rails on hand to lay the track to Zacatecas, and those on the way to Vera Cruz will enable Fresnillo to be reached, where track-laying from this end will stop. The track is ballasted as fast as laid, and placed in excellent condition, so that the regular running of through trains to the United States will probably begin within ten days after the ends of the tracks meet. By the time of the great celebration of the event, which has been set for the 5th of May, comes off, the connection of the Aztec capital with the rest of the continent will have become an old story; but the great benefits of the change will have begun to make themselves fully manifest, and there is no danger that public enthusiasm will not be kindled to highest pitch. The suggestions of the Financier concerning the celebration, urging the meeting of the Presidents of the two Republics thus joined have been received with enthusiasm by the press of the United States as well as of this Republic. Mr. Robinson, the General Superintendent, in a letter to President Nickerson, gives an estimate of the cost of the line from Chihuahua to Fresnillo, in which he says: 'For the work and material which we are to pay for in Mexican silver I have entered as such, and that to be paid in United States currency as such. In arriving at the cost per mile we have treated Mexican silver as 86 cents. These figures bring our cost per mile, \$13,538, United States currency.'

This does not include equipment, nor right of way and station grounds. Our equipment, as it stands to-day, is a little over \$900,000, and our right-of-way and depot grounds from Chihuahua to Fresno will cost us about \$75,000. Counting all our equipments on hand, and the right-of-way, \$1,000,000, it would increase the cost per mile about \$2,000, bringing the grand total a little less than \$16,000 per mile United States money."

Missouri Pacific.—The actual earnings and expenses of the Missouri Pacific proper and the St. Louis, Iron Mountain & Southern for the three months ending Sept. 30 are reported as follows:

	Mo. Pacific.	Iron Mountain.	Total.
Earnings	\$2,002,093	\$2,103,704	\$4,105,797
Expenses	1,154,231	986,121	2,140,352
Net earnings	\$1,448,462	\$1,117,583	\$2,566,045
Fixed charges and dividends			1,540,847

Surplus for the quarter \$1,025,198

The Missouri Pacific expenses were 44.3 per cent. of gross earnings; the Iron Mountain, 49.9, and the united expenses 45.5 per cent. The dividend paid was the usual one, of 1½ per cent. for the quarter.

New Brighton & New Castle.—The litigation with the Pittsburgh, Youngstown & Chicago Co. over the right of way at Rock Point has been removed to the Pennsylvania Supreme Court.

New Orleans, St. Bernard & Plaquemine.—This company has been organized to build a railroad from New Orleans down the left or east bank of the Mississippi to Port Eads, a distance of 104 miles.

New York, New Haven & Hartford.—This company's statement to the Massachusetts Railroad Commission for the year ending Sept. 30 gives the following figures:

Earnings (\$26.184 per mile).....	\$6,729,374
Expenses (69.2 per cent.).....	4,705,346
Net earnings (\$7.876 per mile).....	\$2,024,028
Rentals, etc.....	\$440,840
Dividends, 10 per cent.....	1,550,000
	1,960,840

Surplus for the year \$93,188

The statement includes all the leased lines. As compared with the previous year there was an increase of \$791,566, or 13.3 per cent., in gross earnings; an increase of \$737,227, or 18.6 per cent., in expenses, and a gain in net earnings of \$54,330, or 2.8 per cent.

New York, Pennsylvania & Ohio.—The Voting Trustees have issued the following statement in London:

"In answer to inquiries with regard to the Chicago & Atlantic guarantee we have to state that this guarantee is only contingent and under the Erie lease can involve no loss on the New York, Pennsylvania & Ohio. Under the original guarantee the Erie and the New York, Pennsylvania & Ohio were liable (to the extent of the earnings supplied by the Chicago & Atlantic business) to make good any deficiency in the funds of the Chicago & Atlantic to meet its mortgage interest (\$390,000). Roughly speaking, the Erie was to contribute about 4-7 of such deficiency and the New York, Pennsylvania & Ohio 3-7. By article 19 of the lease, however, the share of the New York, Pennsylvania & Ohio, under such guarantee, has to be met by the Erie out of the gross earnings of the New York, Pennsylvania & Ohio before division into 68 and 32 per cent. (or 65 and 35 per cent.), thus relieving the net revenue of the New York, Pennsylvania & Ohio of two-thirds of any possible liability under this head. Supposing the Chicago & Atlantic to earn nothing toward mortgage interest in any year, the net revenue of the New York, Pennsylvania & Ohio would have to advance to the Chicago & Atlantic about \$60,000. But to make this liability attach, traffic to the extent of \$180,000 gross must have been furnished to the New York, Pennsylvania & Ohio road by the Chicago & Atlantic, of which, under the lease, the New York, Pennsylvania & Ohio Co. would have received from the Erie (say one-third, i. e.) \$60,000. Since the Chicago & Atlantic line was fully opened, it has commanded such a large business that there appears no reason for anticipating the guarantors being called on to advance any considerable sum, even during the first year of its existence. The trustees also desire to remind bondholders that in future the amount available for first mortgage interest, each Jan. 1 and July 1, will be the actual net revenue for the period ending Sept. 30 and March 31 respectively last preceding. This it is expected will have the effect of virtually equalizing the cash payments of interest. The change will commence with the next January payment. As regards the recent law proceedings in America, the trustees do not regard them as of any serious or practical importance, though they may be vexatiously prolonged. There can be no question but that the application recently made by the plaintiffs resulted in a real defeat."

Northern Pacific.—The Palouse Branch is now completed and opened for traffic to Colfax, Wash. Ter., 89 miles eastward from the main line at Palouse Junction. This branch passes through a section of Eastern Washington, which is growing in population rapidly.

At the special meeting in New York, Nov. 20, the preferred stockholders voted to authorize the issue of \$20,000,000 second-mortgage bonds, 352,428 shares (over the two-thirds required) being voted in favor of the proposed issue and only 63 shares against it. The new bonds, however, cannot be issued until the pending litigation to enjoin them is settled.

Ohio Central.—A press dispatch from Cincinnati Nov. 15 says: "Argument was heard to-day by the United States Circuit Court in the proceedings for the appointment of a Receiver for the Ohio Central Railroad. Two questions were discussed: whether the road should be foreclosed under the bondholders' bill or under that of the Central Trust Co.; and who should be appointed Receiver. E. L. Andrews, for certain bondholders, suggested Thomas R. Sharp, formerly of the Baltimore & Ohio, as Receiver, making the point that the receiver should be disconnected with the Seney syndicate. Thomas E. Stillman, for the Trust Co., named John E. Martin. The Court intimated that two receivers might be appointed, one to manage the road and the other to bring suits for the recovery of assets, saying this need not delay foreclosure, as suits for the recovery of assets could follow foreclosure. The Court announced that it would render its decision in the second week of December."

Ohio & Mississippi.—The Receiver makes the following statement to the Court for October:

Cash on hand Oct. 1.....	\$245,321
Receipts from all sources.....	607,244
Total.....	\$853,065
Vouchers, pay-rolls, etc.....	\$474,536
Coupons due paid.....	210,000
	684,536
Cash on hand Nov. 1.....	\$168,467

The receipts were less than the payments by \$77,354 for the month.

It is in contemplation to build new shops for this road either at Vincennes or at Washington, Ind. As to which will be finally selected, much depends on the relative liberality of the two towns. Washington has the advantage of location, being almost exactly at the centre of the main line of the road between Cincinnati and St. Louis, and being also in the centre of a large coal field. The old shops are at Vincennes, 20 miles further west, and that town will make a strong effort to keep them there.

Oregon Improvement Co.—This company makes the following statement for September and the ten months of its fiscal year from Dec. 1 to Sept. 30:

	September.	Ten months.
Earnings.....	\$382,242	\$3,266,062
Expenses.....	270,721	2,252,289
Net earnings.....	\$111,521	\$1,013,673
Per cent. of expenses.....	70.8	68.9

The earnings show a considerable gain, both for September and the year.

Pennsylvania.—This company's new Ridgeway & Clearfield Branch was opened for business Nov. 19 from Ridgeway, Pa., to Brockwayville, 22 miles. It is operated as a branch of the Philadelphia & Erie Division. The extension of 5 miles from Brockwayville to Falls Creek is nearly finished.

Philadelphia & Reading.—President Gowen has issued a circular in which he announces his intention of resigning the presidency of the Reading Railroad at the expiration of his present term. He recommends George DeB. Keim, the Vice-President, as his successor. He takes this step because the company "has now surmounted all the difficulties of the last four eventful years." In his circular Mr. Gowen says:

"I am glad to be able to announce that the net earnings of the company for the current fiscal year, ending Nov. 30, after providing for all fixed charges, will be equal to 7 per cent. upon the preferred stock, and fully 5 per cent. upon the common stock of the company. As these net earnings are pledged to the payment of the outstanding income mortgage bonds (\$2,454,000), such bonds must be retired before a dividend can be made to the shareholders. I entertain no doubt, however, that the outstanding income mortgage bonds can be provided for out of the proceeds of other securities available for the purpose and the surplus of net earnings over fixed charges carried to the credit of a dividend fund, and in this event it is probable that the opinion of the stockholders will be taken at the forthcoming annual meeting upon the question of the payment of a dividend and the proper amount thereof."

Richmond & Danville.—This company makes the following statement for October and the ten months ending Oct. 31:

	October.	1882.	Ten months.	1882.
Gross earnings:	1883.	1882.	1883.	1882.
Char., Col. & Aug.....	\$98,205	\$90,125	\$608,422	\$580,178
Col. & Greenville.....	86,247	113,806	602,192	592,507
Rich. & Danville.....	429,834	421,704	3,146,808	2,978,062
Virginia Midland.....	176,167	167,017	1,413,266	1,244,526
Western N. C.....	44,006	26,897	312,321	200,510
Total.....	\$834,459	\$828,611	\$6,142,809	\$5,604,783
Net earnings:				
Char., Col. & Aug.....	58,866	40,258	\$298,183	\$149,501
Col. & Greenville.....	47,361	58,721	106,280	113,578
Rich. & Danville.....	225,358	208,796	1,351,189	1,003,200
Virginia Midland.....	86,722	89,970	606,765	470,551
Western N. C.....	14,588	9,329	111,328	45,329
Total.....	\$432,895	\$407,074	\$2,563,545	\$1,781,859

For the month the lines whose business is chiefly cotton show a decrease, but on the whole system there is a small gain both in gross and net earnings.

For the ten months the whole system shows an increase of \$538,036, or 9.6 per cent., in gross earnings; a decrease of \$243,660, or 6.4 per cent., in expenses, and a resulting gain in net earnings of \$781,686, or 43.9 per cent.

The Richmond & Danville proper shows for the ten months an increase of \$168,746, or 5.7 per cent., in gross earnings, with a decrease of \$179,243, or 9.1 per cent., in expenses; the result is a gain in net earnings of \$347,989, or 34.7 per cent.

Rio Grande & Pecos.—It is reported that this road has been sold to the Galveston, Harrisburg & San Antonio Co. It is now completed from Laredo, Tex., to the coal mines at San Tomas, a distance of 27 miles, and is intended to run to Eagle Pass, 135 miles.

Rochester & Pittsburgh.—Regular passenger trains begin running this week over the Buffalo Branch, over which only mixed trains have been run heretofore. Trains will run through Buffalo and the terminus of the road at Poughkeepsie, Pa., 18½ miles. The new time table shows a mail train between Buffalo and Poughkeepsie, and an express between Buffalo and Bradford, 78 miles.

St. Louis, Iron Mountain & Southern.—Notice is given that all of the second preferred income bonds of the St. Louis, Iron Mountain & Southern Railway Co., amounting to \$4,089,000, having been redeemed and the mortgage securing the same canceled of record, funds have been deposited with the Mercantile Trust Co. for the redemption of the outstanding bonds of the first preferred income mortgage of said railway, and that said outstanding bonds will be redeemed in cash at par and accrued interest upon presentation at the office of the Trust Company.

Sanborn, Cooperstown & Turtle Mountain.—It is stated that this road has been sold to the Oregon & Transcontinental Co., and will hereafter be worked as a branch of the Northern Pacific. It is completed from Sanborn, Dak., northward some 30 miles, and is to extend 50 miles further.

South Pennsylvania.—A large number of bids have been received for the grading of the section of this road lately offered for contract. This includes 85 miles on which there is much heavy and expensive work to be done.

Texas & Great Northwestern.—This company has been organized to build a railroad from McKinney, Tex., about 160 miles to Seymour in Baylor County, with a branch from Decatur to Dallas, about 55 miles.

Texas & St. Louis.—The Commercial and Financial Chronicle says: "This important narrow gauge road extends from Bird's Point, Mo., opposite Cairo, Ill., to Gatesville, Texas, a distance of about 723 miles, and with branches 768 miles. It has been under construction for several years, and only opened for through business in 1883. The company has been managed entirely by Western and Southern men. Mr. J. W. Paramore, of St. Louis, being its President."

"The stocks have not been very widely distributed, and both stock and bonds are understood to be largely held by

the promoters of the enterprise and their friends. A new adjustment has been proposed to the stock and bondholders, and the purpose and plan thereof are set forth in a circular, from which the main points are condensed in the statements which follow. The cash assessment of 7½ per cent. is compulsory on the holders of stock and income bonds. A considerable amount is required for improvement of the roads and purchase of new equipment. The plan for readjustment provides for the calling in and cancellation of present first-mortgage bonds issued on Missouri & Arkansas Division at rate of \$12,000 per mile, and on Texas Division at rate of \$8,000 per mile. It is proposed to issue new first-mortgage bonds at rate of \$15,000 per mile and new 6 per cent. second-mortgage income bonds at same rate. They will draw interest only from June 1, 1884, and the first semi-annual coupons will be payable Dec. 1, 1884. An assessment of 7½ per cent. cash on stock and incomes is made, and new stock, first-mortgage bonds and incomes are given to represent this assessment. The time for making the exchange is announced as expiring Dec. 1.

The following tables will show the present outstanding securities, the proposed exchanges thereof for new issues, and the total amount of new issues to be made:

Texas & St. Louis Railway in Mo. and Ark.—452 miles.—For this company new issues of bonds and stock of similar classes are to be made, but of larger amounts, as the following will show:

Securities outstanding:	Rate of exchange.	Equivalent new issues.	Total new issues.
First-mort., \$5,650,000.....	105	\$5,650,000	\$7,350,000
Second-mort. inc., \$5,650,000.....	100	5,650,000	7,350,000
Capital stock, \$5,650,000.....	100	5,650,000	7,250,000

Texas & St. Louis Railway in Texas—315 miles.—For this company there are to be issued first-mortgage bonds, second-mortgage income bonds, and a land company is to be organized with \$2,128,000 scrip and \$2,000,000 stock, which shall take all the land and land claims:

Securities outstanding:	Rate of exchange.	Equivalent new issues.	Total new issues.
First-mort., \$2,128,000.....	110	\$2,341,000	\$5,250,000
General first-mort., \$1,817,000.....	105	1,908,000	
First-mort. id. gt. and inc.			
Gen. 1st mt. id. gt. and inc.			
Capital stock, \$3,945,000.....	100	3,945,000	5,250,000

"Holders of first-mortgage land grant and income bonds will also receive \$2,128,000 land scrip, and holders of general first-mortgage land grant and income bonds will receive \$1,817,000 Land Co. stock."

Toledo Belt.—This company has been organized to build a belt road from the Wheeling & Lake Erie road around the city of Toledo, O. The object is to connect the Wheeling & Lake Erie with the other lines entering Toledo, and with a number of large factories.

Toledo, Cincinnati & St. Louis.—At a meeting of bondholders in Boston, Nov. 17, a committee was appointed to report a plan for the reorganization of the company. This action appears to have been taken independently of the bondholders' committee recently appointed.

Union Pacific.—This company makes the following statement for September and the nine months ending Sept. 30:

	September.	1883.	Nine months.	1882.
Earnings.....	\$2,904,076	\$4,170,315	\$21,551,287	\$21,972,764
Expenses.....	1,535,188	1,360,592	11,500,781	11,480,981
Net earnings.....	\$1,468,888	\$1,909,723	\$10,050,506	\$10,491,783
Per cent. of ex.....	51.3	39.8	53.4	52.3

For the nine months there was a decrease of \$421,477, or 2.0 per cent., in gross earnings, and an increase of \$19,800, or 0.2 per cent., in expenses, the result being a loss in net earnings of \$441,277, or 4.1 per cent. The loss in gross earnings in September was chiefly due to the falling off in the Colorado business and increased competition.

Virginia Midland.—At a meeting of the board held Nov. 19 the following statement was presented for the year ending Sept. 30:

Earnings (\$4.728 per mile).....	\$1,064,204
Expenses (57.5 per cent.).....	956,194
Net earnings (\$2.011 per mile).....	\$708,010
Interest and rentals.....	422,016

Surplus for the year..... \$285,994
The board voted to pay 6 per cent. upon the income bonds from the surplus for the year.

Washington City, Cincinnati & St. Louis.—The franchises and other property have been sold to parties who propose to build the road from Linwood, Va., on the Shenandoah Valley road, to Harrisonburg, 20 miles, and thence westward about 100 miles into the coal region of West Virginia.

Williamstown.—The track on this road is now laid to Glassboro, N. J., 7 miles beyond the old terminus at Williamstown, and 16 miles from the starting point at Atco. The road is now controlled by the Philadelphia & Reading, and will be worked in connection with the New Jersey Southern and the Philadelphia & Atlantic City lines.

Wilmington & Weldon.—At the annual meeting in Wilmington, N. C., Nov. 20, the stockholders resolved to postpone for the present the construction of the new branch or cut-off to Florence, S. C., in view of the unsatisfactory and unsettled condition of railroad business in South Carolina.

Wisconsin, Iowa & Nebraska.—The track on this road is now laid from Marshalltown, Ia., southwest to Baxter in Jasper County, 22 miles; it is also laid from Des Moines northeast three miles, leaving about 20 miles to complete the section between Des Moines and Marshalltown. Tracklaying is in progress at both ends.

On the line from Marshalltown northeast it is stated that the company has decided to build to Cedar Falls instead of Waterloo, on account of trouble in relation to the entrance into the latter town. The track is now laid to a point about 5 miles from Waterloo, and from the present terminus it will run nearly due north to Cedar Falls.

Worcester & Nashua.—Arrangements have been completed for the consolidation of the Nashua & Rochester with this company, under the special acts of the Massachusetts and New Hampshire Legislatures. The consent in writing of nearly all the stockholders has been obtained, and a meeting will be held Dec. 1 to organize the consolidated company, which will be known as the Worcester, Nashua & Rochester Railroad Co. The consolidated company will assume all debts of both companies, and will issue its stock for theirs. The Nashua & Rochester road has been leased and operated by the Worcester & Nashua Co. ever since it was built.

Wrightsville.—This company has been organized to build a railroad from Wrightsville, in Johnson County, Ga., northward to Sun Hill, on the Central road, a distance of about 25 miles. It will pass through and serve a district now without railroad facilities.